Sensory Systems Technical Committee Annual Report

IEEE Circuits and Systems Society
Activities for May 2010 through April 2011

Chair : Bernabe Linares-Barranco, National Microelectronics Center, Spain, bernabe@imse-cnm.csic.es
Chair-Elect: Tobi Delbruck, Institut für Neuroinformatik, Switzerland, tobi@ini.phys.ethz.ch
Secretary: Teresa Serrano-Gotarredona, National Microelectronics Center, Spain, terese@imse-cnm.csic.es
Secretary Elect: Piotr Dudek, University of Manchester, UK, p.dudek@manchester.ac.uk
Past Chair: Shih-Chii Liu, Institut für Neuroinformatik, Switzerland, shih@ini.phys.ethz.ch

Annual Meeting: At ISCAS 2011, Rio de Janeiro, Brazil, Windsor Barra Hotel, Room "**DUCALE I, II, III**", Monday, May 16th 2011 from **17:30 to 18:30.**

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 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 59 active members. The bylaws that govern the status of active members was updated and voted during the annual meeting at ISCAS07. 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". At the last annual meeting at Paris, 31 TC members were present, 2 non members, and 5 new candidate members. The SSTC welcomed the 5 new members last year (Henry Leung, Ray Yueh-Min Huang, Francisco Serra-Graells, Steve Collins, and chai Wah Wu). Thus, last year attendance was 36 of a total of 59 members, representing an attendance rate of 61%).

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

Participation in ISCAS track paper reviews:

The Sensory Systems Track received 51 submissions at ISCAS 2011. Three to six reviews were arranged for each paper. Review Committee Member (RCM) assignments were closely monitored to guarantee reviewers were fairly spread over several institutions and countries. We had a total of 16 RCMs each coordinating the review of 3 or 4 papers. This year RCMs were: Amine Bermak, Gert Cauwenberghs, Shantanu Chakrabartty, Shoushun Chen, Eugenio Cullurciello, Tobi Delbrück, Piotr Dudek, Ralph Etienne-Cummings, Alex Fisch, Roman Genov, Viktor Gruev, Giacomo Indiveri, Andrew Mason, Christoph Posch, Teresa Serrano-Gotarredona, and Milutin Stanacevic.
With 5 Sensory System Sessions (4 oral, 1 posters), we had 26 accepted (51% acceptance rate) papers (20 oral and 6 posters).

The SSTC members Tobi Delbrück and Bernabe Linares-Barranco have organized for the first time in ISCAS a new "Confession Session: Learning from others' Mistakes". This session runs for a time equivalent to a regular oral session (100 minutes) but presents a total of 26 mini-talks. Although the call was announced to the whole ISCAS community, all of the contributions come from the SSTC members. The audience was approximately 100 persons for this session and from this response it looks like the session will be repeated in 2012 in Korea, this time organized by the Analog Signal Processing TC (chaired by Viktor Gruev), in conjunction with the SSTC.

This year, the demonstration track "Live demonstrations of Circuits and Systems" which was initiated from the SSTC and run as a special session from 2006 to 2008 was run for the third time as a regular ISCAS track, co-organized by SSTC members Tobi Delbrück and Eugenio Culurciello. This year there are 8 demo papers, to be exposed without interfering with the Posters, on 2 separate "Time Squares", on one day (Tuesday afternoon).

Best Paper Award:

The 9 best papers in the Sensors track (according to the review scores) were selected by the Sensory Systems track chair (Dr. Linares-Barranco) based on the feedback on all papers from the reviewers and Review Committee Members.
This year we tried a different method to rank the papers. We asked for volunteers among the SSTC membership, excluding the co-authors of the 9 best papers (or people from the same institution). Each volunteer received all 9 papers and was asked to rank them. This way, we believe, a better judgement was made for each paper as each judge could see all of them. Each paper was scored 1 to 9 according to the rank assigned. We had a total of 6 volunteers ranking the papers: Jonathan Tapson, Jennifer Blain Christen, Teresa Serrano-Gotarredona, Orly Yadith-Pecht, Ralph Etienne-Cummings, and Bernabe Linares-Barranco.
The best ranked paper has been selected as the best Sensory Systems track paper for 2011. The second and third ones have been selected for receiving honorary mentions.

The winning and honorary mention papers will be announced at the annual meeting. The winning papers will then be reported in the 2011 SSTC meeting minutes.

3. Journal Special Issues:

Member of the SSTC have been guest editors of special issues in the journals:
- IEEE Transactions on Biomedical Systems
- Journal of Low Power Electronics and Applications
- Journal of Solid-State Circuits
- International Journal of Circuit Theory and Applications
- Special Issue on Synchronization, IEICE

4. Out Reach:

Members of our TC serve on program committees of various conferences such as SPIE, NIPS, ICECS, ESSCIRC, Sensors, bioCAS, EMBC, ISSNIP Biosignals and Biorobotics, SBCCI, APCCAS, IEEE Consumer Electronics Conference, ACM International Conference on Computing Frontiers, Asian Symposium on Quality Electronic Design, IEEE VLSI-SOC, International Symposium on Olfaction

and Electronics Nose, IEEE Int. Mixed-Signal, Sensors, and Systems Test Workshop 2010, IEEE Int. Conf. Very Large Scale Integration 2011and several members are active in organizing IEEE and other conferences and workshops.

Members participate in the Editorial Boards as Associate Editors of many prominent journals, such as Frontiers in Neuroscience, Advances in Artificial Neural Systems, TCASI, TCASII, IEEE Sensors Journal, JSSC, TVLSI, TBioCAS, PlosOne, JETCAS, TNSRE, Journal of Sensors, Journal of Low Power Electronics and Applications, the Neuromorphic Engineer, IEEE Technology News, BioNanoScience, Associate Editor, IEICE NOLTA and International Journal on Bifurcation and Chaos.

Several members of the SSTC have been involved in launching a new journal:
-   Frontiers in Neuromorphic Engineering.

SSTC members have given lectures in different conference:
-   Plenary talk in US-Europe Workshop on Reverse Engineering of the Human Brain
-   Tutorial on CMOS Integrated Circuits for Energy Scavenging and Self-powered Sensors, IEEE Biomedical Circuits and Systems Conference, Paphos, Cyprus, Nov, 2010
-   Invited Talk, International Symposium on Olfaction and Electronic Nose

SSTC members have edited/co-edited special issues in relevant journals:
-   IEEE Transactions on BioCAS, special issue on ISCAS 2010
-   IEEE Transactions on BioCAS, special issue on BioCAS Conference
-   Journal of Low Power Electronics and Application, special issue on selected topics in low power design: From circuits to applications
-   IEEE Journal of Solid-State Circuits, special issue on ISSCC Conference

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**. 1 member (John Harris) is currently a IEEE CAS Distinguished Lecturer.

8. SSTC web site

The SSTC web pages are presently hosted by the IEEE at
http://www.ewh.ieee.org/soc/icss/archive/committees/sensors/sensors-tc.php
The officer and member lists are on the site, as well as reports and minutes. After last year the site was updated by including member photographs and links to their respective home pages. Suggestions for more dynamic content are welcome!

Editing the web site is possible by FTP download/upload. The current secretary (Teresa Serrano-Gotarredona) and Chair (Bernabé Linares-Barranco) currently have access to the site.

9. Vision of the field future

According to the VP of Technical Activities recommendation, after the SSTC annual meeting an e-mail discussion was initiated among the SSTC members to elaborate a report on the SSTC vision of the track field future. Below the final report is transcribed:

The SSTC was created in 1999 composed of 5 members. The original mission of the SSTC was to foster research, development, education and industrial dissemination of knowledge relating to the emerging field of sensors and associated processing systems. Since the beginning its activity was 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. During these 11 years, the field of the sensory systems track has been growing due to the increasing trend of CMOS integration of different kind of sensors as well as the appearance of new technologies for sensor integration.

Nowadays, the field of the sensory systems track encompasses all kind of sensors with its corresponding signal conditioning and/or processing, as well as applications, while putting emphasis on (integrated) circuits and systems (design) issues.

Our view for the next ten years or so is that the field is clearly growing due to several facts:

- new emergent nano-scale devices are appearing with new mechanical, physical, chemical and organic miniaturized capabilities.

- CMOS and non-CMOS integrated circuit scaling will also progress, making it possible to include more and more complex sensory signal processing and storage.

- flexible and powerful reconfigurable computing systems are also being launched into the market, such as very powerful microcontrollers and FPGAs. This enlarges the computation capabilities and broadens the expectations and applications of the sensory processing systems field.

- the field is also getting a strong emphasis on bio-inspired sensing and processing, combining neuroscience discoveries with intelligent machine learning progress into intelligent low power compact sensory-processing systems mimicking biological brain functions.

- there is also a growing research in the combination of sensing and pre-processing circuits to detect the signal of interest while reducing or eliminating other undesired inputs.

-in recent years, we have also observed an increasing activity in the field of network sensors, since the track is receiving an increasing number of such submissions.

- we also see growing interests of industry since all these trends can potentially yield to new applications and markets.

10. Proposal of subtracks

The SSTC members have agreed in reducing the number of subtracks for the ISCAS submission and revision process. This is the proposed list of subtracks:

1. Visual Sensors and Processing

2. Acoustic Sensors and Processing

3. Multi-modal Sensor Processing and Sensor Networks

4. Chemical, Mechanical, Organic and other sensors and corresponding processing

5. Other Topics on Sensory Systems

11. Member updating procedure

The SSTC member agreed to continue with the current member updating procedure established and defined by the TC bylaws. At present, every year each member's activity in the Sensory System field is reviewed for the last three years, as well as his/her direct activities related to Sensory Systems Technical Committee.

12. Proposal of Evaluation Criteria for TCs

The SSTC members have proposed the following ideas for possible criteria to evaluate the technical committees:

1. Increase in the number of members

2. Increase in the number of track submissions

3. Member activities not only inside the CAS but also in other societies

Appendix A: List of members

The list is also maintained on the SSTC web site:
http://ewh.ieee.org/soc/icss/committees/sensors/sensors-tc.php.

1. Pamela Abshire, University of Maryland, pabshire@umd.edu
2. Andreas Andreas Andreou, Johns Hopkins University, andreou@jhu.edu
3. Salvatore Baglio, University of Catania, salvatore.baglio@diees.unict.it
4. Diego Barrettino, University College Cork, Republic of Ireland, d.barrettino@ucc.ie
5. Amine Amine Bermak, The Hong Kong University of Science and Technology, eebermak@ee.ust.hk
6. Gert Cauwenberghs, University of California, San Diego, gert@uscd.edu
7. Shantanu Chakrabartty, Michigan State University, shantanu@msu.edu
8. Jennifer Blain Christen, Arizona State University, jennifer1@asu.edu
9. Marc Cohen, University of Maryland, mhcohen@glue.umd.edu
10. Steve Collins, University of Oxford, steve.collins@eng.ox.ac.uk
11. Timothy Constandinou, Imperial College London, t.constandinou@ic.ac.uk
12. Eugenio Culurciello, Yale University, eugenio.culuriello@yale.edu
13. Tobi Delbruck, University of Zurich and ETH Zurich, tobi@ini.phys.ethz.ch
14. Piotr Dudek, University of Manchester, United Kingdom, p.dudek@manchester.ac.uk
15. Ralph Etienne-Cummings, Johns Hopkins University, retienne@jhu.edu
16. Wai-Chi (Winston) Fang, National Chiao Tung University, wfang@mail.nctu.edu.tw
17. Alexander Fish, ATIPS labs, fish@atips.ca
18. Roman Genov, University of Toronto,Canada, roman@eecg.toronto.edu
19. Maysam Ghovanloo, Georgia Institute of Technology, mghovan@ece.gatech.edu
20. Viktor Gruev, University of Pennsylvania, vgruev@seas.upenn.edu
21. Martin Haenggi, University of Notre Dame, mhaenggi@nd.edu
22. Philipp Hafliger, University of Oslo, Norway, hafliger_at_ifi.uio.no
23. Tara J. Hamilton, University of Queensland, tara@itee.uq.edu.au
24. John Harris, University of Florida, harris@cnel.ufl.edu
25. Paul Hasler, Georgia Institute of Technology, phasler@ece.gatech.edu
26. Arjang Hassibi, University of Texas, arjang@mail.utexas.edu
27. Timothy Horiuchi, University of Maryland, timmer@isr.umd.edu
28. Ray Yueh-Min Huang, National Cheng-Kung University, huang@mail.ncku.edu.tw
29. Zeljko Ignjatovic, Univ of Rochester, ignjatov@ece.rochester.edu
30. Giacomo Indiveri, University of Zurich and ETH Zurich, giacomo@ini.phys.ethz.ch
31. Ce Kuen Shieh, National Cheng Kung University, shieh@ee.ncku.edu.tw
32. Tor Sverre Lande, University of Oslo, bassen@ifi.uio.no
33. Walter D. Leon-Salas,University of Missouri, leonsalasw@umkc.edu
34. Henry Leung, University of Calgary, leungh@ucalgary.ca
35. Bernabe Linares-Barranco, Sevilla Microelectronics Institute, bernabe@imse-cnm.csic.es
36. Shih-Chii Liu, University of Zurich and ETH Zurich, shih@ini.phys.ethz.ch
37. Dimitrios Loizos, Univ. of California, San Diego & NetLogic Microsystems, Inc., dloizos@netlogicmicro.com
38. Franco Maloberti, University of Pavia, Italy, franco.maloberti@unipv.it
39. Andrew Mason, Michigan State University, mason@msu.edu

40. Karim Oweiss, Michigan State University, koweiss@msu.edu
41. Jonne Poikonen, University of Turku, jokapo@utu.fi
42. Christoph Posch, Austrian Institute of Technology, christoph.posch@ait.ac.at
43. Khaled Salama, Rensaleer Polytechnic Institute, khaled@ecse.rpi.edu
44. Mohamad Sawan, Polytechnique Montreal, mohamad.sawan@polymtl.ca
45. André van Schaik, Sydney University, andre@ee.usyd.edu.au
46. Francisco Serra-Graells, Barcelona Microelectronics Institute, paco.serra@imb-cnm.csic.es
47. Teresa Serrano-Gotarredona, Sevilla Microelectronics Institute, terese@imse-cnm.csic.es
48. Bertram Shi, Hong Kong University of Science and Technology, eebert@ee.ust.hk
49. Chen Shoushun, Nanyang Tech. Univ. (NTU) Singapore, eechenss@ntu.edu.sg
50. Milutin Stanacevic, SUNY, Stonybrooke, milutin@ece.sunysb.edu
51. John Tapson, Univ. of Cape Town, Jonathan.Tapson@uct.ac.za
52. Orly Yadid-Pecht, Ben-Gurion University, oyp@ee.bgu.ac.il
53. yuJie (George) Yuan, Hong Kong Univ. Science & Techn., eeyuan@ust.hk
54. Jacob Vogelstein, Johns Hopkins University, jacob.vogelstain@jhuapl.edu
55. Chai Wah Wu, IBM Research, chaiwahwu@ieee.org
56. Denise Wilson, University of Washington, denisew@u.washington.edu
57. Peter (Chung-Yu) Wu, National Chiao Tung University, cywu@alab.ee.nctu.edu.tw
58. Mona Zaghloul, George Washington University, zaghloul@gwu.edu
59. Akos Zarandy, Hungarian Academy of Sciences, zarandy@sztaki.hu

Appendix B: member activities

Of the 59 members at the end of this period (including the 6 new members added at last annual meeting), 27 submitted activity reports.

Amine Bermak (2010-2011)

IEEE Services

Professional Activities and Service

Member of the IEEE Technical Committee on Sensory Systems.
Member of the IEEE Technical Committee on Biomedical Circuits and Systems.
Member of Technical Program Committee of the IEEE European Solid-State Circuits, 2010-2011 and the IEEE Consumer Electronics Conference CEC'2007-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.
Associate Editor Journal of Low Power Electronics and Applications
Review Editor Frontiers in Neuromorphic Engineering
Guest Editor, Special issue on IEEE Transactions on Biomedical Circuits and Systems, Nov 2010 (special issue of the IEEE BioCAS 09 Conference).

Awards, Honors, Patents:

Co-author of the paper receiving the "Best student paper award" at the major conference: *IEEE International Symposium on Circuits and systems ISCAS, Paris, France, 2010*
"Smart and high-performance sensing technologies for future microsystems applications" *Keynote Opening Talk at the International Conference of High-Speed Circuits Design (HSCD2010)* Taiwan, Oct.28-29 2010.
"Exploring new frontiers for CMOS Image Sensors Using Time-domain Approach" *Invited Seminar at KAIST, Deijon,* South Korea, August 2009.
"Wide Dynamic Range Compressive Sampling Smart CMOS Image Sensors" *Invited Seminar at Yonsei University, and Chungbuk National University, Electrical and Electronic Engineering Department*, Seoul, South Korea, April 2009.
 "A Sub-uW Embedded CMOS Temperature Sensor for RFID Food Monitoring Applications," *US Patent 61/344,123*; filed in 2010.
"Photo-Aligned Liquid-Crystal Micropolarimeter Array and Its Manufacturing Method," *US Patent 12/784,355*; filed in 2009.
"Self-integrating Energy Harvesting CMOS image Sensor," *US Patent 12/711,034*; filed in 2009.

Publications

Peer Reviewed Papers:

Kwan Ting Ng, Farid Boussaid(*, and Amine Bermak, "A robust CMOS single-chip gas recognition circuit for metal oxide gas sensor arrays", IEEE Transaction on Circuits and Systems I, accepted.
T. Fang and A. Bermak, "An 84pW/Frame per Pixel Current-Mode CMOS Image Sensor with Energy Harvesting Capability, IEEE Sensors Journal, Accepted.
X. Zhao, F. Boussaid(*), A. Bermak, and V. G. Chigrinov, "High-resolution thin 'guest-host' micropolarizer arrays for visible imaging polarimetry", Optics Express, accepted.
M. K. Law, C. Shi and A. Bermak, "A Low Power Energy Harvesting Logarithmic CMOS Image Sensor with Reconfigurable Resolution using Two-Level Quantization Scheme", IEEE Transaction on Circuits and Systems II, vol. 58, no. 2, pp. 80-84, 2011.
Q. Li and A. Bermak, "A Low-Power Hardware-Friendly Binary Decision Tree Classifier for Gas Identification", Journal of Low Power Electronics and Applications, accepted.

S. Leomant(*), K. L. Lau and A. Bermak, "A Low Power Compact Digital Pixel Sensor (DPS) Using 2T-DRAM", Journal of Low Power Electronics and Applications, Accepted.

D. G. Chen, D. Matolin, A. Bermak and C. Posch, "Pulse Modulation Imaging - Review and Performance Analysis", IEEE Transactions on Biomedical Circuits and Systems, vol. 5, no. 1, pp. 64-82, 2011.

C. Shi, M. K. Law and A. Bermak, "A Novel Asynchronous Pixel for Energy Harvesting CMOS Image Sensor", IEEE Transactions on Very Large Scale Integration Systems, vol. 19, no. 1, pp. 118-129, 2011.

H. T. Chen, K. T. Ng, A. Bermak, M. K. Law and D. Martinez, "Spike latency coding in a biologically inspired micro-electronic nose", IEEE Transactions on Biomedical Circuits and Systems, vol. 5, no. 2, 2011.

X. Zhao, A. Bermak, F. Boussaid(*) and V. G. Chigrinov, "Liquid-crystal micropolarimeter array for full Stokes polarization imaging in visible spectrum", Optics Express, vol. 18, no. 17, pp. 17776-17787, 2010.

J. Yin, J. Yi, M. K. Law, Y. Ling, M. C. Lee, K. P. Ng, B. Gao, H. C. Luong, A. Bermak, M. Chan, W. H. Ki, C. Y. Tsui and M. Yuen, "A system-on-chip EPC Gen-2 passive UHF RFID tag with embedded temperature sensor", IEEE Journal of Solid-State Circuits, vol. 45, no.11, pp. 2404-2420, 2010.

S. Chen, A. Bermak, and Y. Wang, "A CMOS Image Sensor with on Chip Image Compression based on Predictive Boundary Adaptation and Memoryless QTD Algorithm", IEEE Transactions on Very Large Scale Integration Systems, to appear, (10 pages), 2010.

F. Tang and A. Bermak, "A 4T Low-Power Linear-Output Current-Mediated CMOS Imager", IEEE Transactions on Very Large Scale Integration Systems, to appear, (10 pages), 2010.

M. Zhang and A. Bermak, "Quadrant Based On-line Spatial and Temporal Compressive Acquisition for CMOS Image Sensor", IEEE Transactions on Very Large Scale Integration Systems, to appear, (10 pages), 2010.

M. K. Law and A. Bermak, "High Voltage Generation with Stacked Photodiodes in Standard CMOS Process", IEEE Electron Device Letters, vol. 31, no. 12, pp. 1425-1427, 2010.

M. Zhang and A. Bermak, "CMOS Image Sensor with On-Chip Image Compression –A Review and Performance Analysis", Journal of Sensors, vol. 2010, 920693, 2010.

M. K. Law, A. Bermak and H. C. Luong, "A Sub-uW Embedded CMOS Temperature Sensor for RFID Food Monitoring Application", IEEE Journal of Solid-State Circuits, vol. 45, no. 6, pp.1246-1255, 2010.

M. Zhang and A. Bermak, "Compressive Acquisition CMOS Image Sensor --From Algorithmic Solution to Hardware Implementation", IEEE Transactions on Very Large Scale Integration Systems, vol. 18, no. 3, pp.490-500, 2010.

Peer Reviewed Conference Papers:

Denis Guangyin Chen, Amine Bermak, and Chi Ying Tsui, A Low-complexity Image Compression Algorithm for Reducing Address-Event Representation (AER) Overhead in PWM Image Sensors, accepted for publication in IEEE International Symposium on Circuits and Systems, May 2011

F. Tang, Y. Cao and A. Bermak, "An Ultra-low Power Current-Mode CMOS Image Sensor with Energy Harvesting Capability", Accepted at the European Solid-State Conference, ESSCIRC 2010, Madrid 2010.

J. Yin, J. Yi, M. K. Law, Y. Ling, M. C. Lee. K. P. Ng, H. C. Luong, A. Bermak, et. Al, "A System-on-Chip EPC Gen-2 Passive UHF RFID Tag with Embedded Temperature Sensor", IEEE Solid State Circuit Conference ISSCC 2010, pp.308-309, San Francisco, Feb. 2010.

K. T. Ng, F. Boussaid(*) and A. Bermak, "A frequency-based signature gas identification circuit for SnO2 gas sensors", IEEE International Symposium on Circuits and Systems, (ISCAS 2010), pp. 2275-2278, May, 2010, Paris, France ("Best student paper award").

X. Zhang, A. Bermak and F. Boussaid(*), "Dynamic Voltage and Frequency Scaling for Low-power Multi-precision Reconfigurable Mutiplier", IEEE International Symposium on Circuits and Systems, (ISCAS 2010), pp. 45-48, May, 2010, Paris, France.

S. Léomant(*), X. Wu and A. Bermak, "A Single Bit Memory per Pixel Time Domain DPS using Multi-Reset Integration Scheme", IEEE International Symposium on Circuits and Systems, (ISCAS 2010), pp. 353-356, May, 2010, Paris, France.

X. Zhao, A. Bermak, F. Boussaid(*) and V. G. Chigrinov, "Liquid-crystal micropolarimeter array for visible linear and circular polarization imaging", IEEE International Symposium on Circuits and Systems (ISCAS), (ISCAS 2010), pp. 637-640, May, 2010, Paris, France.

H. T. Chen, A. Bermak, A. Khalifa and D. Martinez, "An Integrated Wireless Electronic Nose System Integrating Sensing and Recognition Functions", IEEE International Symposium on Circuits and Systems, (ISCAS 2010), pp. 2798-2798, May, 2010, Paris, France.

M. Zhang and A. Bermak, "Architecture of 3D Compressive Acquisition CMOS Image Sensor", IEEE Sensors Conference 2010, Nov 2010.

F. Tang and A. Bermak, "Low-power and High-speed Current-mode CMOS Imager with 1T Biasing Scheme", IEEE Sensors Conference 2010, Nov 2010.

M. Zhang, Y. Wang and A. Bermak, "Block-Based Compressive Sampling for Digital Pixel Sensor Array", Asia Symposium & Exhibits on Quality Electronic Design, ASQED 2010, pp. 9-12, Penang, Malaysia, 2010.

Y. Wang, A. Bermak and F. Boussaid(*), "FPGA implementation of Compressive Sampling for Sensor Network Applications", Asia Symposium & Exhibits on Quality Electronic Design, ASQED 2010, pp. 5-8, Penang, Malaysia, 2010.

F. Tang and A. Bermak, "Read-out Circuit Analysis for High-speed Low-noise VCO Based APS CMOS Image Sensor", International Symposium on Electronic Design, Test and Applications (DELTA 2010), pp. 330-335, Vietnam, 2010.

Y. Cao, A. Bermak and T. Le. "A Smart Hot Pixel Correction Read Out for the CMOS Image Sensor in Biomedical Applications", DELTA 2010, pp. 103-107, Vietnam, 2010.

Q. Li, G. Liang and A. Bermak, "A High-speed 32-bit Signed/Unsigned Pipelined Multiplier" IEEE International Symposium on Electronic Design, Test & Applications (DELTA 2010), pp. 207-211, Vietnam, 2010.

K. L. Lau, S. Léomant(*) and A. Bermak, "A Hybrid CMOS DPS with Conditional Data Readout Scheme", International Symposium on Electronic Design, Test and Applications (DELTA 2010), pp. 44-47, Vietnam, 2010.

Gert Cauwenberghs (2010-2011)

IEEE Service

Program chair, IEEE Engineering in Medicine and Biology Conference (EMBC 2012), San Diego CA, Aug. 29-Sept. 2, 2012.

General co-chair, IEEE Biomedical Circuits and Systems Conference (BioCAS 2011), San Diego CA, Nov. 10-12, 2011.

Program chair, ISSNIP Biosignals and Biorobotics Conference 2011, Vitoria, Brazil, Jan. 6-8, 2011.

Program chair, ISSNIP Biosignals and Biorobotics Conference 2010, Vitoria, Brazil, Jan. 4-6, 2010.

Program co-chair, 20th Symp. Integrated Circuits and Systems Design (SBCCI'2007), Rio de Janeiro, Brazil, Sept. 3-6, 2007.

Other program committees: Wireless Health 2010-2011, SPIE Biosensing II (OP106) 2010-2011, BioCAS 2010, ISCAS 2010-2011.

Short Courses, Plenary Sessions, Keynotes, Invited Lectures

"Neuromorphic Adaptive Microsystems for Visual Reconnaissance," *Bio-Inspired Computing Seminar*, Air Force Research Laboratory, Wright-Patterson OH, Feb. 2, 2010.

"Auditory Neuroengineering for Intelligent Hearing Aids," *TATRC Acoustic Trauma Workshop*, Del Mar CA, Febr. 10, 2010.

"Reverse Engineering the Visual System in Neuromorphic Silicon," *Neurosciences Seminar*, University of California Riverside, Apr. 27, 2010.

"Silicon and Biological Adaptive Neural Circuits," Plenary talk, *US-Europe Workshop on Reverse Engineering of the Human Brain* (European Science Foundation, National Science Foundation, and Air Force Office of Scientific Research), Dubrovnik, Croatia, May 24, 2010.

"Wireless Brain Interfaces," *Beyond Brain Machine Interface Workshop*, Neural Interfaces Conference, Long Beach CA, June 20, 2010.

"Humans, Machines, Spikes, and Dopamine in Sequential Games," *Computational Neuroscience Minisymposium*, Workshop on Neuromorphic Cognitive Engineering, Telluride CO, July 5, 2010.

Professional Activities and Service

Editor-in-Chief, IEEE Transactions on Biomedical Circuits and Systems (TBioCAS).

Senior Editor, IEEE Journal on Emerging Topics in Circuits and Systems (JETCAS).

Senior Editor, IEEE Sensors Journal.

Associate Editor, IEEE Trans. Neural Systems and Rehabilitation Engineering (TNSRE).

Associate Editor for the new Journal "Frontiers in Neuromorphic Engineering", as part of the open access "Frontiers in Neuroscience" journal series (http://www.frontiersin.org/).

Board Memberships:

Biomedical Engineering Society (BMES); Society for Neuroscience (SfN); International Neural Network Society (INNS); American Association for the Advancement of Science (AAAS).

Technical committees, IEEE Circuits and Systems Society: Analog Signal Processing; Neural Systems and Applications; Biomedical Circuits and Systems; Sensory Systems; Cellular Neural Networks and Array Computing.

Awards, Honors, Patents:

IEEE Fellow, class of 2011, for contributions to integrated biomedical instrumentation.

Publications

Peer Reviewed Papers:

Dry-Contact and Noncontact Biopotential Electrodes: Methodological Review, Y.M Chi, T.P. Jung, and G. Cauwenberghs, IEEE Reviews in Biomedical Engineering, vol. 3, pp. 106-119, 2010.

Analog VLSI Biophysical Neurons and Synapses with Programmable Membrane Channel Kinetics, T. Yu and G. Cauwenberghs, IEEE Trans. Biomedical Circuits and Systems, vol. 4 (3), pp. 139-148, 2010.

A SiGe BiCMOS 8-Channel Multi-Dithering, Sub-Microsecond Adaptive Controller, D.N. Loizos, P.P. Sotiriadis and G. Cauwenberghs, IEEE Trans. Circuits and Systems I: Regular Papers, vol. 57 (1), pp. 53-63, 2010.

1.1 TMACS/mW Fine-Grained Stochastic Resonant Charge-Recycling Array Processor, R. Karakiewicz, R. Genov, and G. Cauwenberghs, IEEE Sensors Journal, doi: 10.1109/JSEN.2011.2113393, to appear.

A CMOS In-Pixel CTIA High-Sensitivity Fluorescence Imager, K. Murari, R. Etienne-Cummings, N.V. Thakor, and G. Cauwenberghs, IEEE Transactions on Biomedical Circuits and Systems, doi: 10.1109/TBCAS.2011.2114660, to appear.

Photon Counting, Censor Corrections, and Lifetime Imaging for Improved Detection in Two-photon Microscopy, J.D. Driscoll, A.Y. Shih, S. Iyengar, J.J. Field, G.A. White, J.A. Squire, G. Cauwenberghs, and D. Kleinfeld, J. Neurophysiology, doi:10.1152/jn.00649.2010, April 6, 2011.

Peer Reviewed Conference Papers:

Wireless Non-Contact Cardiac and Brain Monitoring, Y.M. Chi, P. Ng, E. Kang, J. Kang, J. Fang, and G. Cauwenberghs, Proc. ACM Wireless Health Conf. (WH 2010), San Diego, Oct. 4-6, 2010.

Micropower Integrated Bioamplifier and Auto-ranging ADC for Wireless and Implantable Medical Instrumentation, Y.M. Chi and G. Cauwenberghs, Proc. IEEE Eur. Solid State Circuits Conf. (ESSCIRC 2010), Sevilla, Spain, Sept. 13-17, 2010.

Wireless Physiological Monitoring and Ocular Tracking: 3D Calibration in a Fully-Immersive Virtual Health Care Environment, L. Zhang, Y.M. Chi, E. Edelstein, J. Schulze, K. Gramann, A. Velasquez, G. Cauwenberghs, and E. Macagno, Proc. IEEE Engineering in Medicine and Biology Conf. (EMBC 2010), Buenos Aires, Argentina, Aug. 31-Sept. 4, 2010.

A Subthreshold aVLSI Implementation of the Izhikevich Simple Neuron Model, V. Rangan, A. Ghosh, V. Aparin, and G. Cauwenberghs, Proc. IEEE Engineering in Medicine and Biology Conf. (EMBC 2010), Buenes Aires, Argentina, Aug. 31-Sept. 4, 2010.

Wireless Non-contact EEG/ECG Electrodes for Body Sensor Networks, Y.M. Chi and G. Cauwenberghs, Proc. Body Sensor Networks (BSN 2010), Biopolis, Singapore, June 7-9, 2010.

Log-Domain Time-Multiplexed Realization of Dynamical Conductance-Based Synapses, T. Yu and G. Cauwenberghs, Proc. IEEE Int. Symp. Circuits and Systems (ISCAS'2010), Paris France, May 30-June 2, 2010.

Intensity Histogram CMOS Image Sensor for Adaptive Optics, Y.M. Chi, G. Carhart, M.A. Vorontsov, and G. Cauwenberghs, Proc. IEEE Int. Symp. Circuits and Systems (ISCAS'2010), Paris France, May 30-June 2, 2010.

Scalable Event Routing in Hierarchical Neural Array Architecture with Global Synaptic Connectivity, S. Joshi, S. Deiss, M. Arnold, J. Park, T. Yu, and G. Cauwenberghs, Proc. IEEE Int. Workshop Cellular Nanoscale Networks and Their Applications (CNNA 2010), Berkeley CA, Febr. 3-5, 2010.

Book Chapters

Books

Shantanu Chakrabartty (2010-2011)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Morphing, Synthesis and Monitoring: Exploring the trinity of Hybrid Analog Integrated Circuits, Department of Engineering Mechanics, Penn State University, Apr. 2011.

Tutorial on CMOS Integrated Circuits for Energy Scavenging and Self-powered Sensors, IEEE Biomedical Circuits and Systems Conference, Paphos, Cyprus, Nov, 2010
.

Professional Activities and Service

Technical Program Committee Member :

- IEEE Biomedical Circuits and Systems Conference (2006 – present)
- 11th Biennial Asia Pacific Conference on Circuits and Systems (APCCAS2010)
- Symposium on Integrated Circuits and Systems Design (SBCCI 2010)

Guest Editor :

- IEEE Transactions of Biomedical Circuits and Systems (Special Issue on ISCAS' 2010)

Board Memberships:

2010 – present, IEEE Trans. on BioMedical Circuits and Systems Associate Editor
2007- present, Advances in Artificial Neural Systems, Associate Editor
2010 – present, Frontiers in Neuromorphic Engineering, Review Editor

Technical Committee Member: IEEE Circuits and Systems: Sensory Systems
Technical Committee Member: IEEE Circuits and Systems: Biomedical circuits and systems
Technical Committee Member: IEEE Circuits and Systems: Neural Systems and Applications.

Awards, Honors, Patents:

U.S. National Science Foundation, CAREER Award, 2010.
Michigan State University, Teacher-Scholar Award, 2010.
S. Chakrabartty, ``Self-powered Strain-rate Sensor", US Patent: 7,757,565, Issued Jul. 20, 2010.

Publications

Peer Reviewed Journal Papers:

C. Huang, S. Chakrabartty, `` A current-input current-output CMOS logarithmic amplifier based on translinear Ohm's law", *Electronics Letters*, vol. 47, no: 7, pp. 433-434, 2011.

C. Huang, S. Chakrabartty, ``A Compact Self-powered CMOS Strain-rate Monitor for Piezoelectric Energy Scavengers", *Electronics Letters*, vol. 47, no:4, pp. 277-278, 2011

Y. Liu, M. Gu, E.C. Alocilja, S. Chakrabartty, Co-detection: Ultra-reliable Nanoparticle-Based Electrical Detection of Biomolecules in the Presence of Large Background Interference, *Biosensors and Bioelectronics,* Vol. 26, No:3, pp.1087-1092, 2010.

Y. Liu, E.C. Alocilja, S. Chakrabartty, Biomolecules Detection using a Silver-Enhanced Gold Nanoparticle-Based Biochip, *Nano Research Letters*, 2010, DOI 10.1007/s11671-010-9542-0.

A.Fazel, A.Gore, S.Chakrabartty, ``Resolution Enhancement in sigma-delta Learners for Super-Resolution Source Separation**"**, *IEEE Transactions of Signal Processing*, vol. 58, no:3, pp. 1193 – 1204, 2010.

A.Gore, A.Fazel, S. Chakrabartty, ``Far-field Acoustic Source Localization and Bearing Estimation using Sigma-delta Learners"**,** *IEEE Transactions of Circuits and Systems I,* vol. 57, no:4, pp. 783 – 792, 2010, DOI: 10.1109/TCSI.2009.2027627.

C.Huang, N.Lajnef, S. Chakrabartty, ``Calibration and Characterization of Self-powered Floating-gate Usage Monitors with Single Electron per Second Operational Limit"**,** *IEEE Transactions of Circuits and Systems I,* vol. 57, no: 3, pp. 556 – 567, 2010.

A.Gore, S. Chakrabartty, ``A Min-Max Optimization Framework for Designing SigmaDelta Learners: Theory and Hardware"**,** *IEEE Transactions of Circuits and Systems I,* vol. 57, no: 3, pp. 604 – 617, 2010.

Peer Reviewed Conference Papers:

C. Huang, S. Chakrabartty, `` Multi-functional self-powered sensor for long-term ambient vibration monitoring", *Proc. of SPIE Smart Structures + NDE*, San Diego, 2011.

C. Huang, S. Chakrabartty, `` A miniature batteryless health and usage monitoring system based on hybrid energy harvesting", *Proc. of SPIE Smart Structures + NDE*, San Diego, 2011.

C. Huang, S.Chakrabartty, ``A Temperature Compensated Array of CMOS Floating-Gate Analog Memory", *Proc. of IEEE Symposium of Circuits and Systems (ISCAS 2010)*, Paris, 2010.

M.Gu, Y. Liu, S.Chakrabartty, ``Fast: a Simulation Framework for Solving Large-Scale Probabilistic Inverse Problems in Nano-Biomolecular Circuits", *Proc. of IEEE Symposium of Circuits and Systems (ISCAS 2010)*, Paris, 2010.

A. Fazel, S.Chakrabartty, `` Sigma-Delta Learning for Super-resolution Source Separation on High-density Microphone Arrays", *Proc. of IEEE Symposium of Circuits and Systems (ISCAS 2010)*, Paris, 2010.

S.Chakrabartty, S.C. Liu, ``Exploiting Spike-based Dynamics in a Silicon Cochlea for Speaker Identification", *Proc. of IEEE Symposium of Circuits and Systems (ISCAS 2010)*, Paris, 2010.

Book Chapters

S.Chakrabartty, E.C. Alocilja, Y.Liu, ``Integrated Nano-Bio-VLSI Approach for Designing Error-free Biosensors", *Nano-biosensors*, eds. Sandro Carrara, Springer, 2010

Books

Dr Timothy Constandinou (2010-2011)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

"Microelectronics for Neural Interfacing", Wellcome Trust Workshop (with focus on Biomedical Engineering), Institute of Biomedical Engineering, University of Oxford, 10th November 2010.

"Bio-Inspired Medical Device Technology for Next Gen. Healthcare", Lifelong Health Project Mini Summer Symposium on Diseases in Ageing, Imperial College Healthcare NHS Trust, 14th July 2010.

Professional Activities and Service

Member of the IEEE CAS Society, BioCAS Technical Committee (2005-present).

Member of the Technical Committee for the IEEE BioCAS conference (2005-present).

Member of the Steering Committee for the IEEE BioCAS conference (2010-2011).

Publications Chair: IEEE BioCAS 2010 (Cyprus)

Technical Program Co-Chair- IEEE BioCAS 2010 (Cyprus) & IEEE BioCAS 2011 (San Diego)

Session chair - IEEE BioCAS 2010, IEEE ISCAS 2011

P Häfliger, TG Constandinou, "Guest Editorial—Special Issue on Selected Papers From ISCAS 2009", IEEE Transactions on Biomedical Circuits and Systems, Vol. 4, pp. 137 – 138, 2010.

Board Memberships:

Elected IET (UK Institution for Engineering Technology) Awards Committee Member (2010 – 2013)

Elected IET (UK Institution for Engineering Technology) Young Professionals Awards Sub-committee Member (2010 – 2013)

Publications

Peer Reviewed Papers:

Peer Reviewed Conference Papers:

P Abshire, AG Andreou, A Bermak, G Cauwenberghs, S Chen, JB Christen, TG Constandinou, E Culurciello, M Dandin, T Datta, T Delbruck, P Dudek, A Eftekhar, R Etienne-Cummings, G Indiveri, MK Law, B Linares-Barranco, J Tapson, W Tang, Y Zhai, "Confession Session: Learning from Others Mistakes", Proc. IEEE International Symposium on Circuits and Systems (ISCAS – Rio de Janeiro, Brazil), 2011.

M Sole, A Sanni, A Vilches, C Toumazou, TG Constandinou, "A Bio-Implantable Platform for Inductive Data and Power Transfer with Integrated Battery Charging", Proc. IEEE International Symposium on Circuits and Systems (ISCAS – Rio de Janeiro, Brazil), 2011.

S Luan, A Eftekhar, O Murphy, TG Constandinou, "Towards an Inductively Coupled Power/Data Link for Bondpad-Less Silicon Chips", Proc. IEEE International Symposium on Circuits and Systems (ISCAS – Rio de Janeiro, Brazil), 2011.

Y Hu, L Liu, TG Constandinou, C Toumazou, "A 5s-Time-Constant Temperature-Stable Integrator for a Tuneable PID Controller in LOC Applications", Proc. IEEE International Symposium on Circuits and Systems (ISCAS – Rio de Janeiro, Brazil), 2011.

P Georgiou, ZDC Goh, TG Constandinou, T Prodromakis, C Toumazou, "A CMOS-Based Lab-on-Chip Array for Combined Magnetic Manipulation and Opto-Chemical Sensing", Proc. IEEE International Symposium on Circuits and Systems (ISCAS – Rio de Janeiro, Brazil), 2011.

A Serb, K Nikolic, TG Constandinou, "A CMOS-based light modulator for contactless data transfer", Proc. SPIE Photonics West (San Francisco, USA), Vol. 7943, 2011.

A Eftekhar, S Paraskevopoulou, TG Constandinou, "Towards Next Generation Neural Interfaces: Optimizing Power, Bandwidth and Data Quality", Proc. IEEE International Conference on Biomedical Circuits and Systems (BioCAS- Paphos, Cyprus), pp. 122-125, 2010.

Book Chapters

Books

Eugenio Culurciello (2010-2011)

IEEE Services

Short Courses

Plenary Sessions

Keynote Speakers

Invited for the 9th International System-on-Chip (SoC) Conference on November 2, or on November 3, in Newport Beach, California

Invited Lectures

- Samsung, Korea, April 27th 2011 "An hardware accelerated vision system for general-purpose vision algorithms"
- University of Illinois at Chicago, April 8th 2011 "The Eye of the Terminator: Modeling the human visual system in hardware"
- NYU/Poly February 15th, 16th 2011 "Modeling the human visual system in hardware", host Dr. Chao
- Yale Institute for Nanoscience and Quantum Engineering, January 28th 2011, Synthetic eyes, vision, and tools to reverse engineer the brain from the e-Lab team @ Yale - host Paul Fleury
- IEEE Yale chapter: "How the magic 5 from Yale vanquished Intel and nVidia: The story of NeuFLow: the first Eye of the Terminator", Tuesday, September 28th 2010, host: Hur Koser
- Purdue August 19th 2010 , "Biomedical instrumentation for optical brain imaging and high-throughput patch-clamp" host Dr. Wodicka
- Swartz Seminar, Yale Neuroscience 5/14/2010, "The eye of the Terminator: modeling the visual system in hardware" host: Xiao-Jing Wang
- NYU – 5/12/2010, "The eye of the Terminator: modeling the visual system in hardware" host: Yann LeCun
- Northeastern University 3/30/2010: "Novel biomedical instrumentation for optical brain imaging and high-throughput patch-clamp", host. Dana Brooks"
- University of New Haven, March 3rd 2010, "Integrated biomedical instrumentation: miniature patch-clamp and brain imaging devices", host: Prof. Orabi

Professional Activities and Service

-IEEE ISCAS Special Sessions Organizer
-Reviewer for: IEEE International Circuits and systems (ISCAS), IEEE Transactions on Neural Networks, Kluwer Analog Integrated Circuits and Signal Processing, IEEE region 4 Electro-information Technology Conference, IEEE Electron Devices, IEEE Transaction on Circuits and Systems I and II, IEEE Transactions on Biomedical Circuits and Systems, IEEE Sensors, IEEE Transactions on VLSI Systems, Elsevier Optics Communications, PloS ONE Synthetic Vision Systems, IEEE Journal of Solid-State Circuits, IEE Electronics Letters.

Board Memberships:

- IEEE Circuits and Systems Society, Committee member: Sensory Systems, Biomedical Circuits and Systems, Neural Networks

Awards, Honors, Patents:

- Awarded the Presidential Early Career Award for Scientists and Engineers (PECASE) in December 2010 by president Barack Obama.
- **November 2010:** elected to be a Distinguished Lecturer of the IEEE by the society of Circuits and Systems (CASS) for 2011-2012 by the Neural Systems & Applications Technical Committee.

Publications

Peer Reviewed Papers:

A Tri-Mode Smart Vision Sensor with 11-Transistors/pixel for Wireless Sensor Networks, D. Kim, E. Culurciello, IEEE Transactions on Circuits and Systems I, TCAS-I, Special Issue on ISCAS 2010, May 2011, invited Paper, submitted, under review.
Patch-clamp amplifiers on a chip, P. Weerakoon, E. Culurciello, Y. Yang, J. Santos-Sacchi, P. J. Kindlmann, Fred J. Sigworth, Journal of Neuroscience Methods, Elsevier 2010, Volume 192, Issue 2, 15 October 2010, Pages 187-192.

A 3nV/rtHz Rail-to-Rail Operational Amplifier in Silicon-on-Sapphire with Constant Transconductance, P. Weerakoon, P. Kindlmann, F.J. Sigworth, E. Culurciello, Analog Integrated Circuits and Signal Processing, Springer 2010, Volume 65, Number 2, 311-319, DOI: 10.1007/s10470-010-9484-6.

Peer Reviewed Conference Papers:

Demonstration: NeuFlow: a dataflow processor for convolutional nets and other real-time algorithms, Clement Farabet, Berin Martini, Polina Akselrod, Benoit Corda, Selcuk Talay, Yann LeCun and Eugenio Culurciello, Neural Information Processing Systems conference, NIPS 2010, December 7th 2010, live demonstration.

NeuFlow: a neural vision processor for real-time object categorization in megapixel videos, Clement Farabet, Berin Martini, Polina Akselrod, Benoit Corda, Selcuk Talay, Yann LeCun and Eugenio Culurciello, Applied Imagery Pattern Recognition AIPR 2010, Washington, DC, October 13-15, 2010.

Bio-Inspired Vision Processor for Ultra-Fast Object Categorization, Clement Farabet, Berin Martini, Polina Akselrod, Benoit Corda, Selcuk Talay, Yann LeCun and Eugenio Culurciello, High Performance Embedded Computing Workshop, HPEC 2010, MIT Lincoln Laboratories, 15-16 September 2010.

Activity-Driven, Event-Based Vision Sensors, Tobi Delbruck, Bernabe Linares-Barranco, Eugenio Culurciello, Christoph Posch, IEEE International Symposium on Circuits and Systems, 2010. ISCAS 2010, Paris, France, pp. 2426 - 2429.

A VLSI Neural Monitoring System with Ultra-Wideband Telemetry for Awake Behaving Subjects, E. Greenwald, M. Mollazadeh, N. Thakor, W. Tang, E. Culurciello, IEEE International Symposium on Circuits and Systems, 2010. ISCAS 2010, Paris, France, pp. 1193 - 1196.

Book Chapters

"Large-Scale FPGA-Based Convolutional Networks" in "Scaling Up Machine Learning" upcoming 2010 Cambridge University Press book, edited by Ron Bekkerman, Misha Bilenko, and John Langford, chapter authors: C. Farabet, Y. LeCun, K. Kavukcuoglu, B. Martini, P. Akselrod, S. Talay and E Culurciello.

Books

Tobi Delbruck (2010-2011)

IEEE / OtherServices

Co-organizer: Live Demonstrations of Circuits and Systems, ISCAS, (2009 to present)
Co-organizer: Telluride Neuromorphic Cognition Engineering Workshop (2008-present)
Incoming chair of CAS Sensory Systems TC.
Member of the IEEE CAS Sensory Systems, Neural Systems and Applications TCs .
Member of Society for Neuroscience.

Publications

Peer Reviewed Papers:

Neuromorphic Sensory Systems, (2010), Current Opinions in Neurobiology, 20:1-8, themed issue on Sensory Systems, edited by Kevan Martin and Kristin Scott. DOI 10.1016/j.conb.2010.03.007.

Peer Reviewed Conference Papers:

Event-Based 64-Channel Binaural Silicon Cochlea with Q Enhancement Mechanisms, S.C. Liu, A. van Schaik, B.A. Minch, T. Delbruck, in ISCAS 2010, Paris, (in press) Runner up best paper award from Sensory Systems Technical Committee

Activity-Driven, Event-Based Vision Sensors, T. Delbruck, B. Linares-Barranco, E. Culurciello, C. Posch, in ISCAS 2010, Paris, pp. 2426-2429.

Event-based color change pixel in standard CMOS, R. Berner and T. Delbruck, in ISCAS 2010, Paris, (in press). Overall Best Student Paper Award, ISCAS 2010 and also Best paper award from Sensory Systems Technical Committee. In top ranked papers, ISCAS 2010; invited for special issue of TCAS.

Temporal Contrast AER Pixel with 0.3%-Contrast Event Threshold, T. Delbruck and R. Berner, in ISCAS 2010, Paris, pp. 349-352. In top ranked papers, ISCAS 2010; invited for special issue of TCAS.

32-bit Configurable bias current generator with sub-off-current capability, T. Delbruck, P. Lichtsteiner, R. Berner, C. Dualibe, in ISCAS 2010, Paris, (in press).

Fully integrated 500uW speech detection wake-up circuit, T. Delbruck, T. Koch, R. Berner, H. Hermansky, in ISCAS 2010, Paris, pp. 2015-2018. In top ranked papers, ISCAS 2010; invited for special issue of TCAS.

Piotr Dudek (2010-11)

IEEE Services

Secretary Elect of the IEEE CAS Sensory Systems Technical Committee
Member of the IEEE CAS Neural Systems Technical Committee
Member of the IEEE CAS Cellular Neural Networks and Array Processing Technical Committee

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Invited talk/Tutorial on Vision Sensors with Cellular Processor Arrays at the "Telluride Neuromorphic Engineering Workshop", Telluride, July 2010

Professional Activities and Service

Chair of Special Interest Group on 'Neurally Inspired Engineering', UK Neuroinformatics Node of the International Neuroinformatics Coordinating Facility (INCF)
Review Editor, Frontiers in Neuromorphic Engineering
Scientific/Technical/Review Committee member: ISCAS, ICST, ECCTD

Publications

Peer Reviewed Papers:

A.Lopich and P.Dudek, "Asynchronous Cellular Logic Network as a Co-Processor for a General-Purpose Massively Parallel Array", International Journal of Circuit Theory and Applications, DOI: 10.1002/cta.679, 29 April 2010

G.Indiveri, B.Linares-Barranco, T.J.Hamilton, A.van Schaik, R.Etienne-Cummings, T.Delbruck, S.C.Liu, P.Dudek, P.Häfliger, S.Renaud, J.Schemmel, G.Cauwenberghs, J.Arthur, K.Hynna, F.Folowosele, S.Saighi, T.Serrano-Gotarredona, J.Wijekoon, Y.Wang and K.Boahen, "Neuromorphic Silicon Circuits", Frontiers in Neuroscience, 5:73. pp 1-23, doi: 10.3389/fnins.2011.00073, 2011

Peer Reviewed Conference Papers:

S.Carey, A.Lopich and P.Dudek, "A Processor Element for a Mixed Signal Cellular Processor Array Vision Chip", IEEE International Symposium on Circuits and Systems, ISCAS 2011, 16-18 May 2011
J.H.B.Wijekoon and P.Dudek,"Analogue CMOS Circuit Implementation of a Dopamine Modulated Synapse", IEEE International Symposium on Circuits and Systems, ISCAS 2011, 16-18 May 2011
T.Delbruck and B.Linares-Barranco, et.al. , "Confession Session: Learning from Others Mistakes",IEEE International Symposium on Circuits and Systems, ISCAS 2011, 16-18 May 2011
A.Lopich, P.Dudek, "Cellular Processor Array Design in 3D Integrated Circuit Technology", Workshop on 3D integration, Design, Automation and Test in Europe, DATE 2011, Geneva, 14-18 March 2011
K.Brohan, A.Cope, K.Gurney and P.Dudek, "Reinforcement learning in a self-organised representation of feature space", Tenth International Conference on Epigenetic Robotics, EpiRob 2010, Örenäs Slott, Sweden, 5-7 November 2010
K.Brohan, K.Gurney and P.Dudek, "Using reinforcement learning to guide the development of self-organised feature maps for visual orienting", Artificial Neural Networks - ICANN 2010, Lecture Notes in Computer Science, Volume 6353/2010, pp.180-189, September 2010
A.Cope, J.Chambers, D.Barr, P.Dudek and K.Gurney, "Systems level model integration and embodiment: a case study with gaze control", Bernstein Conference on Computational Neuroscience, BCCN 2010, Berlin, September 2010
A.Lopich and P.Dudek, "An 80×80 general-purpose digital vision chip in 0.18 μm CMOS technology", IEEE International Symposium on Circuits and Systems, ISCAS 2010, pp 4257-4260, May 2010

Book Chapters

P.Dudek, "SCAMP-3: A Vision Chip with SIMD Current-mode Analogue Processor Array", in "Focal-Plane Sensor-Processor Chips"A.Zarandy (Ed.), p.17-43, ISBN: 978-1-4419-6474-8, Springer, 2011
A.Lopich and P.Dudek, "ASPA: Asynchronous-Synchronous Focal Plane Sensor Processor Chip", in "Focal-Plane Sensor-Processor Chips" A.Zarandy (Ed.), p.73-104, ISBN: 978-1-4419-6474-8, Springer, 2011

Ralph Etienne-Cummings (2010-11)

Conferences or workshops

Session Chairman: International Symposium on Circuits and Systems (ISCAS 2010)
Session Chairman: Biomedical Circuits and Systems Conference (BioCAS 2010)
Program Committee: Biomedical Circuits and Systems Conference (BioCAS 2010)
Program Committee: ACM International Conference on Computing Frontiers
Steering Committee: Biomedical Circuits and Systems Conference (BioCAS 2010)
Organizer: NSF Telluride Neuromorphic Engineering Workshop, Telluride, CO

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures:

Invited Speaker: Applied Physics Lab, Laurel, MD, April 2010.
Invited Speaker: Mitre Corporation, Mclean, VA, April 2010.
Invited Speaker: CNS Conference, Boston University, Boston, MA, May 2010.
Invited Speaker: CAARMS Conference, Baltimore, MD, June 2010.

Distinguished Lecturer in 2010-2011:

DLP: U. Texas, Austin, September 2010

Editorial Service:

Journal of Low-Power Electronics and Applications, Editorial Board
Frontiers in Neuromorphic Engineering, Editorial Board
IEEE Sensors Journal, Senior Associated Editor,
IEEE Trans. Biomedical Circuits and Systems, Associated Editor
The Neuromorphic Engineer, Editorial Board

Publications (Journal Articles, Conference Papers, Books, Book Chapters):

Journal Articles

K. Murari, R. Etienne-Cummings, G. Cauwenberghs and N. Thakor, "A CMOS In-Pixel CTIA High Sensitivity Fluorescence Imager," accepted to *IEEE Trans. Biomedical Circuits and Systems*, Fall 2010.

B. Asiyanbola, C. Obasi, R. Etienne-Cummings, J. Lewin, "Sponges And Incorrect Sponge Count Are A Minor Contribution To The Problem Of Retained Foreign," *Journal of the American College of Surgeons*, Vol. 211, No. 3, 2010.

R. J. Vogelstein, S. Harshbarger, M. Mcloughlin, J. Beaty, S. Yantis, C. Connor, N. Thakor, C. Priebe, R. Etienne-Cummings, "Research Program in Applied Neuroscience," *Johns Hopkins Apl Technical Digest*, Vol. 28, No. 3, pp. 222-223, 2010.

G. Orchard and R. Etienne-Cummings, "Discriminating Multiple Nearby Targets Using a Single Ping Ultrasonic Mapping," *IEEE T. Circuits and Systems I*, Vol. 57, No. 11, pp. 2915-2924, Nov 2010.

A. Russell, G. Orchard, Y. Dong, S. Mihalas, E. Niebur, J. Tapson, R. Etienne-Cummings, "Optimization methods for spiking neurons and networks", *IEEE Transactions on Neural Networks*, Vol. 21, No. 12, pp. 1950-1962, Dec 2010.

V. Gruev, Z. Yang, R. Etienne-Cummings and J. Van der Spiegel, "Switchless Current Mode Active Pixel Sensor," accepted to *IEEE T. Circuits and Systems I*, Vol. 57, No. 6, pp. 1154 – 1165, June 2010.

Conference Papers

C. Obasi, C. Cheng-Wu, C. Sciortini, R. Ettiene-Cummings, J. S. Lewin and B. Asiyanbola, "Sponges and incorrect sponge count: Limited contribution to the current process of detecting retained foreign bodies," *Clinical Congress of the American College of Surgeons*, Oct 8 2010

J. Senarathna, K. Murari, N. Li, R. Etienne-Cummings and N. Thakor, "Miniaturized Laser Speckle Contrast Imaging Microscope," 2nd International Conference on Mathematical and Computational Biomedical Engineering – CMBE201, March 2011.

A. Harrison, R. and R. Etienne-Cummings, "Event-based Imager," *IEEE BioCAS'10 Conference*, Cyprus, Nov. 3 – 5, 2010

K. Mazurek, R. Etienne-Cummings et al, "A Locomotion Processing Unit (LPU)," *IEEE BioCAS'10 Conference*, Cyprus, Nov. 3 – 5, 2010

Books and Book Chapters

Awards, Honors, and Patents:

R. W. Hart Prize for Excellence in IR&D for Best Project, *JHU/APL*, November 2010

Appointed to the IEEE CAS Society Distinguish Lecturer Program, *IEEE*, January 2010

B. Asiyanbola, C. Cheng-Wu, J. Levin, R. Etienne-Cummings, Roger Hammons, "A New System For The Detection Of Post Operative Retained Foreign Bodies," JHTT Ref.: C10417_P10417-02; Venable Ref.: 2240-294739.

B. Asiyanbola, W. Akinpelu, R. Etienne-Cummings, R. Hammons, "Decontamination Apparatus," PTC International Application, P10418-03 for U.S. Application 61/174261 and 61/293031, May 2010.

M. Massie, R. Etienne-Cummings, S. Baxter, J.P. Curzan, "Variable Acuity Imager with Pitch, Yaw and Roll Measurement," Patent #7,808,528, September 2010.

Other IEEE Service:

Appointed to the Nominations Committee of the CAS Society, August 2010

Other Professional Service:

Mentor of Robotics Club, *JHU*, September 2009 - Present

Director of the Robotics Minor, *JHU*, September 2010 - Present

Member of the Robotics MSE Curriculum Committee, *JHU*, September 2010 - Present

Member of the ASE Continuous Review Committee, MD Higher Education Commission , Annapolis, MD, September 2009 - Present

Co-Organizer of MRCIIS Winter School, *JHU*, January 12th – 16th, 2009 - Present

Member of Engineering and Applied Science Programs for Professionals Curriculum Committee, Whiting School of Engineering, *JHU*, 2007 – Present

Associate Director for Education and Outreach, ERC on CISST, *JHU*, 2004 – Present

Co-Chair of Diversity Committee, ERC on CISST, *JHU*, 2004 – Present

Co-PI SITE REU Program & Supervised REU Students, ERC on CISST, *JHU*, 2000 – Present

Organization Committee, *NSF Sponsored Course on Telluride Neuromorphic Engineering*, 2002 –Present

Served on various committees to improve the education experience for undergraduate students, *SIUC, JHU*, 1995 – Present

Supervised Various Research, Senior Design and Independent Studies, *SIUC, JHU, UMCP, UCT*, 1995 - Present

Media and Popular Press:

Featured on CNN in "Earth's Frontiers"

Featured in IEEE Spectrum Article on "Thinking Like a Human"

Feature in JHU Whiting School of Engineering Magazine Articles

Alexander Fish (2010-2011)

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

"Digital Low voltage Logic in the Era NaNoscale CMO**S**", invited lecture, Tel Aviv University, March 2010.

"Low voltage Logic and SRAM design", invited lecture, IBM, October 2010.

Professional Activities and Service

Co-chair, Circuit and System Design track, The 3rd Asia Symposium on Quality Electronic Design (ASQED), 2011
Guest co-Associate Editor, IEEE Sensors Journal, special issue on Design Methodologies for Low Power Arrays", 2011
Special issue editor, Special Issue "Selected Topics in Low Power Design - From Circuits to Applications", Journal of Low Power Electronics and Applications, MDPI, 2011
Member of the IEEE CAS Neural Networks, Biocas and Sensors Technical Committees (2007 – present).

Board Memberships:

Editor-in-Chief, Journal of Low Power Electronics and Applications, MDPI
Associate Editor, IEEE Sensors Journal

Awards, Honors, Patents:

Morgenshtein, A., Fish, A., & I. A. Wagner, "Logic circuit and method of logic circuit design", US Pat. 7716625, May 11, 2010

Publications

Peer Reviewed Papers:

A. Spivak, A. Teman, A. Belenky, O. Yadid-Pecht and A. Fish, "Power-Performance Tradeoffs in Wide Dynamic Range Image Sensors with Multiple Reset Approach", Journal of Low Power Electronics and Applications, pp.59-76, vol 1, 2011.
A. Spivak, A. Belenky, A. Fish, O. Yadid-Pecht, " A Wide Dynamic Range CMOS Image Sensor with Gating for Night Vision Systems", accepted to IEEE Transactions on Circuits and Systems II: Express briefs, Nov 2010.
A.Teman, O.Yadid-Pecht and A.Fish, "Large VLSI Arrays – Power and Architectural Perspectives", International Journal Information Technologies and Knowledge (IJ ITK), vol. 4, issue 1, pp. 76-88, 2010.

Peer Reviewed Conference Papers:

S. Fisher, R. Dagan, S. Blonder and A. Fish, An Improved Model for Delay/Energy Estimation in Near-Threshold Flip-Flops", Proc. IEEE ISCAS'11, Brazil, May, 2011.
A. Teman and A.Fish, "Sub-threshold and Near-threshold SRAM Design", Proc. of the IEEEI, Eilat, Israel, Nov. 2010.
A. Morgenshtein, I. Shwartz and A. Fish, "Gate Diffusion Input (GDI) Logic in Standard CMOS Nanoscale Process", Proc. of the IEEEI, Eilat, Israel, Nov. 2010.
D. Shurin, E. Kvaktun and A. Fish, "Input Vector Control Efficiency in Sub-Micron CMOS Technologies" Proc. of the IEEEI, Eilat, Israel, Nov. 2010.

Maysam Ghovanloo (2010-2011)

IEEE Services

Track Co-Chair, IEEE Engineering in Medicine and Biology Conference, Wearable Sensors Principle and Technology, Buenos Aires, Argentina, September 2010.
Track Co-Chair, IEEE Engineering in Medicine and Biology Conference, Wearable Sensor Application, Buenos Aires, Argentina, September 2010.
Track Co-Chair, IEEE Engineering in Medicine and Biology Conference, Implantable Sensors Principle and Technology, Buenos Aires, Argentina, September 2010.
Technical Review Committee, IEEE Intl. Symp. on Circuits and Systems (ISCAS'10), Paris, France, June 2010.

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Poster presentation on "An inductively powered multichannel wireless implantable neural recording system-on-a-chip for neuroscience research applications," *National Institutes of Health*, Neural Interfaces Conference, Long Beach, CA, Jun. 2010.
Poster presentation on "Brain-tongue-computer interfacing," *National Institutes of Health*, Neural Interfaces Conference, Long Beach, CA, Jun. 2010.

Poster presentation on "An RFID-based closed loop wireless power transmission system for biomedical applications," *National Institutes of Health*, Neural Interfaces Conference, Long Beach, CA, Jun. 2010.

Professional Activities and Service

Associate Editor, IEEE Transactions on Biomedical Circuits and Systems, (Dec 2010 – Present)
Associate Editor, IEEE Transactions on Circuits and Systems II, (Dec 2007 – Present)
Guest Editor, IEEE Journal of Solid-State Circuits, Special Issue on ISSCC 2011 (Jan. 2012)
Member of Subcommittee on Imagers, MEMS, Medical and Displays (IMMD), International Solid States Circuits Conference (ISSCC) (Feb. 2009 - Present).

Board Memberships:

Awards, Honors, Patents:

"Leo" People's Choice Award, da Vinci Awards, National Multiple Sclerosis (MS) Society, Sep. 2010
Galaxy of Stars, Barrier Breaker Award for Innovation, Tommy Nobis Center, May 2010.
IEEE Senior member since April 2010
CAREER Award, National Science Foundation (NSF), March 2010.

Publications

Peer Reviewed Papers:

F. Inanlou, M. Kiani, and M. Ghovanloo, "A 10.2 Mbps pulse harmonic modulation based transceiver for implantable medical devices," Accepted for publication in *IEEE J. Solid-State Circuits*, Mar. 2011.

H.M. Lee and M. Ghovanloo, "An integrated power-efficient active rectifier with offset-controlled high speed comparators for inductively-powered applications," Accepted for publication in *IEEE Trans. on Circuits and Systems I*, Sep 2010.

M. Yin and M. Ghovanloo, "A low-noise clockless simultaneous 32-channel wireless neural recording system with adjustable resolution," *Analog Integrated Circuits and Signal Processing*, vol. 66, no. 3, pp. 417-431, March 2011.

F. Inanlou and M. Ghovanloo, "Wideband near-field data transmission using pulse harmonic modulation," *IEEE Trans. on Circuits and Systems I*, vol. 58, no. 1, pp. 186-195, Jan. 2011.

S.B. Lee, H.M. Lee, M. Kiani, U. Jow, and M. Ghovanloo, "An inductively powered scalable 32-channel wireless neural recording system-on-a-chip for neuroscience applications," *IEEE Trans. on Biomed. Circuits and Systems*, vol. 4, no. 6, pp. 360-371, Dec. 2010.

U. Jow and M. Ghovanloo, "Optimization of data coils in a multiband wireless link for neuroprosthetic implantable devices," *IEEE Trans. on Biomed. Circuits and Systems*, vol. 4, no. 5, pp. 301-310, Oct. 2010.

M. Kiani and M. Ghovanloo, "An RFID-based closed loop wireless power transmission system for biomedical applications," *IEEE Trans. on Circuits and Systems II*, vol. 57, no. 4, pp. 260-264, Apr. 2010.

X. Huo and M. Ghovanloo, "Evaluation of a wireless wearable tongue computer interface by individuals with high level spinal cord injuries," *Journal of Neural Engineering*, vol. 7, no. 2, pp. 026008, Apr. 2010.

Peer Reviewed Conference Papers:

B. Gosselin and M. Ghovanloo, "A high-performance analog front-end for an intraoral tongue-operated assistive technology," To be presented at the *IEEE Intl. Symp. on Circuits and Systems*, May 2011.

F. Inanlou, M. Kiani, and M. Ghovanloo, "A novel pulse-based modulation technique for wideband low power communication with neuroprosthetic devices," Proc. *IEEE 32nd Eng. in Med. and Biol. Conf.*, pp. 5326-5329, Sep. 2010.

B. Yousefi, X. Huo, and M. Ghovanloo, "Using Fitts's law for evaluating tongue drive system as a pointing device for computer access," Proc. *IEEE 32nd Eng. in Med. and Biol. Conf.*, pp. 4403-4406, Sep. 2010.

J. Kim, X. Huo, and M. Ghovanloo, "Wireless control of smartphones with tongue motion using tongue drive assistive technology," Proc. *IEEE 32nd Eng. in Med. and Biol. Conf.*, pp. 5250-5253, Sep. 2010.

J. Vidal and M. Ghovanloo, "Towards a switched-capacitor based stimulator for efficient deep-brain stimulation," Proc. *IEEE 32nd Eng. in Med. and Biol. Conf.*, pp. 2927-2930, Sep. 2010.

X. Huo, U.M. Jow, and M. Ghovanloo, "Radiation characterization of an intra-oral wireless device at multiple ISM bands: 433 MHz, 915 MHz, and 2.42 GHz," Proc. *IEEE 32nd Eng. in Med. and Biol. Conf.*, pp. 1425-1428, Sep. 2010.

A.N. Johnson, X. Huo, C.W. Cheng, M. Ghovanloo, and M. Shinohara, "Effects of additional load on hand and tongue performance," Proc. *IEEE 32nd Eng. in Med. and Biol. Conf.*, pp. 6611-6614, Sep. 2010.

G. Bawa, A. Huang, and M. Ghovanloo, "An efficient 13.56 MHz active back-telemetry rectifier in standard CMOS technology," *IEEE Intl. Symp. on Circuits and Systems*, pp. 1201-1204, June 2010.

S.B. Lee, H.M. Lee, M. Kiani, U. Jow, and M. Ghovanloo, "An inductively powered scalable 32-ch wireless neural recording system-on-a-chip with power scheduling for neuroscience applications," Digest of technical papers *IEEE Intl. Solid State Cir. Conf.*, pp. 120-121, Feb. 2010.

Book Chapters

Patents

M. Ghovanloo and K. Najafi, "Demodulator, Chip and Method for Digitally Demodulating an FSK Signal," U.S. patent 7,881,409, Feb. 2011.

Viktor Gruev (2010-2011)

IEEE Services

IEEE CAS ASPTC Chair elect since May 2010 until May 2011

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Invited speaker at UT Austin, October 2010. Talk title: "Seeing the Unseen: Polarization Imaging".
Invited speaker at Washington University School of Medicine, October 2010. Talk title: "Low Noise Polarization Imaging".
Invited speaker at Southern Illinois University in Edwardsville, November 2010. Talk title: "Biologically Inspired Imaging Sensors".

Professional Activities and Service

Board Memberships:

IEEE International Symposium on Circuits and Systems

Awards, Honors, Patents:

V. Gruev, Z. Yang and J. Van der Spiegel, "Current/Voltage Mode Image Sensor With Switchless Active Pixels" U.S. Patent # 7,924,332, April 2011.

V. Gruev, J. Van der Spiegel and N. Engheta, "Sensor And Polarimetric Filters For Real-Time Extraction Of Polarimetric Information at The Focal Plane" U.S. Patent # 7,582,857 B2, September, 2010.

Publications

Peer Reviewed Papers:

Perkins, R.; Gruev, V. "Signal-to-noise analysis of Stokes parameters in division of focal plane polarimeters," *Optics Express* **18**, 25815–25824 (2010).

Gruev, B.; Perkins, R.; York, T., "CCD polarization imaging sensor with aluminum nanowire optical filters," *Optics Express* **18**, pp. 19087–19094 (2010).

Gruev, V.; Van der Spiegel, J.; Engheta, N., "Dual-tier thin film polymer polarization imaging sensor," *Optics Express* **18**, 19292-19303 (2010).

Gruev, V.; Van der Spiegel, J.; Engheta, N., "Dual-tier thin film polymer polarization imaging sensor," *Virtual Journal for Biomedical Optics* **5**, *Issue 13,* (2010).

Gruev, V.; Yang, Z.; Van der Spiegel, J.; Etienne-Cummings, R., "Current Mode Image Sensor with Two Transistors per Pixel," *IEEE Transactions on Circuits and Systems I: Regular Papers* 57, 1154-1165 (2010).

Peer Reviewed Conference Papers:

Gruev, V.; York, T., "High Resolution Polarization Imaging Sensor," International Image Sensor Workshop, Japan, June (2011).

York, T.; Gruev, V., "Optical Characterization of a Polarization Imager" Proc. IEEE Int. Symp. Circuits and Systems, Rio de Janeiro, Brazil (2011).

Perkins, R.; Gruev, V., "Noise Modeling of Stokes Parameters in Division of Focal Plane Polarization Imagers," Proc. IEEE Int. Symp. Circuits and Systems, Rio de Janeiro, Brazil (2011).

York, T.; Perkins, R.; Gruev, V., "Live Demonstration: Material Detection via an Integrated Polarization Imager," Proc. IEEE Int. Symp. Circuits and Systems, Rio de Janeiro, Brazil (2011).

Michael J. Hall, Viktor Gruev, and Roger D. Chamberlain, "Noise Analysis of a Current-Mode Read Circuit for Sensing Magnetic Tunnel Junction Resistance," Proc. IEEE Int. Symp. Circuits and Systems, Rio de Janeiro, Brazil (2011).

Gao, S.; Gruev, V., "Interpolation Methods for Division of Focal Plane Polarimeters," Proc. SPIE, Orlando, FL, (2011).

York, T.; Gruev, V., "Calibration Method for Division of Focal Plane Polarimeters in the Optical and Near Infrared Regime," Proc. SPIE, Orlando FL, (2011).

Dudek, P.; Lopich, A.; Gruev, A., "Vision Sensor with a SIMD Processor Array in a Vertically Stacked 3D Integrated Circuit Technology", Workshop on 3D integration, Design, Automation and Test in Europe, DATE 2010, Dresden, (2010).

Gruev, V.; Perkins, R.; York, T., "Material Detection with a CCD Polarization Imager," Applied Imagery Pattern Recognition Workshop, Washington DC, (2010).

Gruev, V.; Perkins, R.; York, T., "Real-time Polarization Imaging at 1 Megapixel Resolution" *IEEE* Conference on Computer Vision and Pattern Recognition, San Francisco, CA, (2010).

Gruev, V.; Perkins, R.; York, T., "Integrated High Resolution Division of Focal Plane Image Sensor with Aluminum Nanowire Polarization Filters" Proc. SPIE **7672**, (2010).

Book Chapters

Books

Philipp Häfliger (2010-2011)

IEEE Services

IEEE CAS BioCAS TC Chair since May 2010 until May 2012

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Professional Activities and Service

Board Memberships:

chair of the Biomedical Circuits and Systems track of IEEE ISCAS 2011
chair of the Live Demonstrations of Circuits and Systems track of IEEE ISCAS 2010

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:

'Towards an injectable continuous osmotic glucose sensor' Erik Johannessen, Olga Krushinitskaya, Andrey Sokolov, Philipp Häfliger, Arno Hoogerwerf, Christian Hinderling, Kari Kautio, Jaakko Lenkkeri, Esko Strömmer, Vasily Kondratyev, Tor Inge Tønnessen, Tom Eirik Mollnes, Henrik Jakobsen, Even Zimmer and Bengt Akselsen. Journal of Diabetes Science and Technology, vol. 4, issue 4, pp 873-881, 2010 (http://www.journalofdst.org/July2010/PDF/Articles/VOL-4-4-ORG3-JOHANNESSEN.pdf)

Peer Reviewed Conference Papers:

'Live demonstration: inductive power and telemetry for micro-implant' P. Häfliger, Proceedings of the IEEE ISCAS 2010 , P 2775 (http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5117863&isnumber=5117665)

Book Chapters

Books

Tara Julia Hamilton (2010-2011)

IEEE Services

IEEE CAS SSTC member since May 2009

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Invited speaker at the Telluride Neuromorphic and Cognition Engineering Workshop 2010, June - July 2010

Professional Activities and Service

Associate Editor for the new Journal "Frontiers in Neuromorphic Engineering", as part of the open access "Frontiers in Neuroscience" journal series (http://www.frontiersin.org/).

Board Memberships:

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:

T.J. Hamilton, J. Tapson, M. Rapson, C. Jin, A. van Schaik "Understanding the mathematics of hearing using electronic circuits", *ANZIAM J.*, Volume 51, June 2010, Pages C300 – C315.

Peer Reviewed Conference Papers:

T.J. Hamilton, J. Tapson, "A neuromorphic cross-correlation chip", IEEE International Symposium on Circuits and Systems (ISCAS) Rio de Janeiro, Brazil May 2011

B. Thanigaivelan, A. Postula, A. van Schaik, C. Jin, T.J. Hamilton "Symbolic Analysis of the Tau Cell Log-Domain Filter", IEEE Asia Pacific Conference on Circuits and Systems (APCCAS) Kuala Lumpur, Malaysia December 2010

B. Thanigaivelan, D. Ball, J. Wiles, T.J. Hamilton "An 8-Channel Neural Recording System with Programmable Gain and Bandwidth", Asia Pacific Signal and Information Processing Association (APSIPA) Annual Summit and Conference (ASC) Student Poster Symposium Singapore December 2010

S. Mann, T.J. Hamilton "A Neuron Optimized for FPGA Implementation", Asia Pacific Signal and Information Processing Association (APSIPA) Annual Summit and Conference (ASC) Student Poster Symposium Singapore December 2010

L. George, T. Lehmann and T.J. Hamilton "Reusable Power Supply ICs for E-Waste Reduction in Mobile Consumer Electronics", Annual International Conference on Green Information Technology (GREEN IT 2010) Singapore October 2010

T. Lehmann and T. J. Hamilton "Integrated Circuits Towards Reducing E-Waste: Future Design Directions", IEEE International Conference on Green Circuits and Systems (ICGCS) Shanghai, China June 2010

T.J. Hamilton, J. Tapson, C. Jin, A. van Schaik "Investigating the implications of Outer Hair Cell connectivity Using a Silicon Cochlea", IEEE International Symposium on Circuits and Systems (ISCAS) Paris, France 2010

J.Tapson, T.J. Hamilton, A. van Schaik "The Self-Tuned Regenerative Electromechanical Parametric Amplifier: a Model for Active Amplification in the Cochlea", IEEE International Symposium on Circuits and Systems (ISCAS) 2010

B. Thanigaivelan, A. Postula, T.J. Hamilton "Live Demo: Affine Arithmetic Based Symbolic Circuit Analyzer", IEEE International Symposium on Circuits and Systems (ISCAS) 2010

A. van Schaik, C. Jin, and T.J. Hamilton, "A log-domain implementation of the Izhikevich neuron model", IEEE International Symposium on Circuits and Systems (ISCAS) 2010

A. van Schaik, C. Jin, T.J. Hamilton, S. Mihalas, and E. Niebur, "A log-domain implementation of the Mihalas-Niebur neuron model", IEEE International Symposium on Circuits and Systems (ISCAS) 2010

Book Chapters

A. van Schaik, T.J. Hamilton, and C. Jin "Silicon Models of the Auditory Pathway", Computational Models of the Auditory System, Springer Handbook in Auditory Research (SHAR), Series Editors A.N. Popper, R.R. Fay Springer 2010

Books

Giacomo Indiveri (2010-2011)

IEEE Services

Short courses, Plenary Sessions, Keynote Speakers, Invited Lectures

ISCAS 2010 tutorial: Analog/digital and hybrid bio-silicon circuits for hardware neurons, synapses, and spiking neural networks (together with Sylvie Renaud)

Professional Activities and Services

Member of the IEEE CAS Neural Networks, Biocas and Sensors Technical Committees
Organizer of the CapoCaccia Cognitive Neuromorphic Engineering Workshop

Board Memberships

Board of directors: Telluride Neuromorphic Cognition Engineering Workshop

Publications

A Neuromorphic Saliency-Map based Active Vision System (D. Sonnleithner, G. Indiveri), In Conference on Information Sciences and Systems, CISS 2011, 2011.

Active vision driven by a neuromorphic selective attention system (D. Sonnleithner, G. Indiveri), In Proc. of International Symposium on Autonomous Minirobots for Research and Edutainment, AMiRE 2011, 2011.

Systematic configuration and automatic tuning of neuromorphic systems (S. Sheik, F. Stefanini, E. Neftci, E. Chicca, G. Indiveri), In International Symposium on Circuits and Systems, ISCAS 2011, 2011.

A systematic method for configuring VLSI networks of spiking neurons (E. Neftci, E. Chicca, G. Indiveri, R. J. Douglas), In Neural Computation, 2011.

A Model of Stimulus-Specific Adaptation in Neuromorphic Analog VLSI (R. Mill, S. Sheik, G. Indiveri, S. Denham), In IEEE Transactions on Biomedical Circuits and Systems, 2011. ((submitted))

Attentive motion sensor for mobile robotic applications (C. Bartolozzi, N. K. Mandloi, G. Indiveri), In International Symposium on Circuits and Systems, ISCAS 2011, 2011.

State-Dependent Sensory Processing in Networks of VLSI Spiking Neurons (E. Neftci, E. Chicca, G. Indiveri, M. Cook, R. J. Douglas), In International Symposium on Circuits and Systems, ISCAS 2010, 2010.

A Device Mismatch Compensation Method for VLSI Spiking Neural Networks (E. Neftci, G. Indiveri), In Biomedical Circuits and Systems Conference BIOCAS 2010, 2010.

Synthesis of log-domain integrators for silicon synapses with global parametric control (S. Mitra, G. Indiveri, R. Etienne-Cummings), In International Symposium on Circuits and Systems, ISCAS 2010, 2010.

A Model of Stimulus-Specific Adaptation in Neuromorphic aVLSI (R. Mill, S. Sheik, G. Indiveri, S. Denham), In Biomedical Circuits and Systems Conference BIOCAS 2010, 2010.

Spike-based learning with a generalized integrate and fire silicon neuron. In International Symposium on Circuits and Systems, ISCAS 2010, 2010.

Bernabé Linares-Barranco (2010-2011)

IEEE Services

IEEE CAS SSTC Chair since May 2009 until May 2011
IEEE Chair of CAS Spanich Chapter

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Professional Activities and Service

Associate Editor for the new Journal "Frontiers in Neuromorphic Engineering", as part of the open access "Frontiers in Neuroscience" journal series (http://www.frontiersin.org/).

Board Memberships:

IEEE International Symposium on Circuits and Systems, Special Session Co-organizer "Confession Session", (ISCAS 2011)

Awards, Honors, Patents:

IEEE Fellow since January 2010

Publications

Peer Reviewed Papers:

J. A. Pérez-Carrasco, B. Acha, C. Serrano, L. Camuñas-Mesa, T. Serrano-Gotarredona, and B. Linares-Barranco, "Fast Vision through Frame-less Event-based Sensing and convolutional Processing. Application to Texture Recognition," *IEEE Trans. Neural Networks,* vol. 21, No. 4, pp. 609-620, April 2010.

Juan Antonio Leñero-Bardallo, T. Serrano-Gotarredona, and B. Linares-Barranco, "A 5-Decade Dynamic Range Ambient-Light-Independent Calibrated Signed-Spatial-Contrast AER Retina with 0.1ms Latency and Optional Time-to-First-Spike Mode," IEEE Trans. on Circuits and systems, Part-I, vol. 57, No. 10, pp. 2632-2643, October 2010.

L. Camuñas-Mesa, A. Acosta-Jiménez, C. Zamarreño-Ramos, T. Serrano-Gotarredona, and B. Linares-Barranco, "A 32x32 Pixel Convolution Processor Chip for Address Event Vision Sensors with 155ns Event Latency and 20Meps Throughput," IEEE Trans. Circ. and Syst. Part-I, vol. 58, No. 4, pp. 777-790, April 2011.

J. A. Leñero-Bardallo, T. Serrano-Gotarredona, B. Linares-Barranco, "A 3.6us Asynchronous Frame-Free Event-Driven Dynamic-Vision-Sensor," IEEE J. of Solid-State Circuits, June 2011.

B. Linares-Barranco, T. Serrano-Gotarredona, L. A. Camuñas-Mesa, Jose A. Perez-Carrasco, C. Zamarreño-Ramos and T. Masquelier, "On Spike-Timing-Dependent-Plasticity, Memristive Devices, and building a Self-Learning Visual Cortex," Frontiers in Neuromorphic Engineering (inaugural issue), 5:26, 2011. doi: 10.3389/fnins.2011.00026 (available from: http://www.frontiersin.org/neuromorphic_engineering/10.3389/fnins.2011.00026/abstract)

C. Zamarreño-Ramos, T. Serrano-Gotarredona, and B. Linares-Barranco, "An Instant-Startup Jitter-Tolerant Manchester-Encoding Serializer/Deserializar Scheme for Event-Driven Bit-Serial LVDS Inter-Chip AER Links," IEEE Trans. Circ. and Syst. Part-I, in Press.

Peer Reviewed Conference Papers:

Camuñas-Mesa, L.; Pérez-Carrasco, J.A.; Zamarreño-Ramos, C.; Serrano-Gotarredona, T.; Linares-Barranco, B.; "On scalable spiking convnet hardware for cortex-like visual sensory processing systems," Proceedings of the 2010 IEEE International Symposium on Circuits and Systems (ISCAS), 2010, Page(s): 249 – 252.

Leñero-Bardallo, J.A.; Serrano-Gotarredona, T.; Linares-Barranco, B.; "A signed spatial contrast event spike retina chip," Proceedings of the 2010 IEEE International Symposium on Circuits and Systems (ISCAS), 2010, Page(s): 2438 – 2441.

Pérez-Carrasco, J.A.; Zamarreño-Ramos, C.; Serrano-Gotarredona, T.; Linares-Barranco, B.; "On neuromorphic spiking architectures for asynchronous STDP memristive systems," Proceedings of the 2010 IEEE International Symposium on Circuits and Systems (ISCAS), 2010, Page(s): 1659 – 1662.

Delbrück, T.; Linares-Barranco, B.; Culurciello, E.; Posch, C.; "Activity-driven, event-based vision sensors," Proceedings of the 2010 IEEE International Symposium on Circuits and Systems (ISCAS), 2010, Page(s): 2426 – 2429.

Leñero-Bardallo, J.A.; Serrano-Gotarredona, T.; Linares-Barranco, B.; "A 100dB dynamic range event-driven spatial contrast sensor with 100μs response time and Time-to-First-Spike mode," Proceedings of the ESSCIRC, 2010 , Page(s): 134 – 137.

Camuñas-Mesa, L.; Pérez-Carrasco, J.A.; Zamarreño-Ramos, C.; Serrano-Gotarredona, T.; Linares-Barranco, B.; "Neocortical frame-free vision sensing and processing through scalable Spiking ConvNet hardware," Proceedings of the 2010 International Joint Conference on Neural Networks (IJCNN), 2010 , Page(s): 1 – 8.

Pérez-Carrasco, J.A.; Serrano, C.; Acha, B.; Serrano-Gotarredona, T.; Linares-Barranco, B.; "Spike-Based Convolutional Network for Real-Time Processing," Proceedings of the 2010 20th International Conference on Pattern Recognition (ICPR), 2010 , Page(s): 3085 – 3088.

Book Chapters

Books

Shih-Chii Liu (2010-2011)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

"Artificial spike-based audition", invited for 2nd Global COE Intl Symp Electronic Devices Innovation, EDIS 2009 - Series Workshop, Advances in Neuroengineering III, Osaka, Japan, Feb 2010.

Professional Activities and Service

Track Co-Chair of the 2011 ISCAS Neural Systems and Networks Track
Member of the IEEE CAS Sensory Systems and Neural Systems and Applications Technical Committees
Chair of IEEE Swiss CAS/ED Chapter
Reviewer for Neural Information Processing Systems (NIPS) Conference, IEEE TCAS, IEEE TNN, IEEE TBCAS journals

Board Memberships:

IEEE Trans. on Biomedical Circuits and Systems Associate Editor
Frontiers in Neuromorphic Engineering Associate Editor

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:

Y-X Wang, S-C. Liu, "A two-dimensional configurable active silicon dendritic neuron array", IEEE Transactions on Circuits and Systems, 2011.

S-C. Liu, T. Delbruck, "Neuromorphic sensory systems", Current Opinion in Neurobiology, Vol. 20, pp. 288-295, 2010.

Y-X Wang, S-C. Liu, "Multilayer processing of spatiotemporal spike patterns in a neuron with active dendrites", Neural Computation, Vol. 22. pp. 2086-2112, 2010.

P. D'Souza, S-C. Liu, R. Hahnloser,"The perceptron learning rule derived from spike-frequency adaptation and spike-time-dependent plasticity", Proceedings of the National Academy of Sciences, Vol. 107. pp. 4722-4727, 2010.

Peer Reviewed Conference Papers:

S-C. Liu, N. Mesgarani, J. Harris, H. Hermansky, "The use of spike-based representations for hardware audition systems", IEEE International Symposium on Circuits and Systems (ISCAS'10) Paris, May 2010, pp. 93-96.

S-C. Liu, A. van Schaik, B. Minch, T. Delbr\"uck, "Event-based 64-channel binaural silicon cochlea with Q enhancement mechanisms", IEEE International Symposium on Circuits and Systems (ISCAS'10) Paris, May 2010, pp. 93-96.

H. Finger, P. Ruvolo, S-C. Liu, J. Movellan, "Approaches and databases for online calibration of binaural sound localization for robotic heads", 2010 IEEE/RSJ International Conference on Intelligent Robots and Systems, Oct 18--22.

Y-X Wang, S-C. Liu, "Motion detection using an aVLSI network of spiking neurons", IEEE International Symposium on Circuits and Systems (ISCAS'10) Paris, May 2010, pp. 93-96.

S. Chakrabartty, S-C. Liu, "Exploiting spike-based dynamics in a silicon cochlea for speaker identification", IEEE International Symposium on Circuits and Systems (ISCAS'10) Paris, May 2010, pp. 513-516.

D. Jaeckel, R. Moeckel, S-C. Liu, "Sound recognition with spiking silicon cochlea and Hidden Markov Models", IEEE Prime, Berlin, Germany, July 2010.

Book Chapters

Books

Andrew Mason, 2010-2011

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

A. J. Mason, "Nanostructured biological/chemical sensor arrays on CMOS," *National Nanofabrication Infrastructure Network Symposium on Organic/Inorganic Interfaces and their Health Science Applications*, Arizona State University, Phoenix AZ, Jan 13-14, 2011.

A. J. Mason and Y. Huang, "Membrane protein biosensor arrays on CMOS," (Invited) *Asia Symposium on Quality Electronic Design*, Malaysia, August 2010.

A. J. Mason, "On-chip Bio-electrochemical Interfaces: Challenges and applications for sensing and biological research," *Science at the Edge Seminar,* Michigan State University, Lansing Michigan, March 2010.

Professional Activities & IEEE Services

IEEE Circuits and Systems Society, Sensory Systems and Biomedical CaS Technical Committees.

Associate Editor, *IEEE Trans. on Biomedical Circ. Systems*

Editorial Board, *BioNanoScience*, Springer

Journal Reviews: IEEE TCAS-I, IEEE TCAS-II, IEEE TBioCaS, IEEE JSSC, IEEE Sensors

Special Sessions Co-Chair, IEEE BioCAS Conference 2010

Technical Review Committee, IEEE Int. Mixed-Signal, Sensors, and Systems Test Workshop 2010, IEEE/EMBS Int. Conf. Engineering in Medicine and Biology 2010, IEEE BioCAS 2010, IEEE ISCAS 2011, IFIO/IEEE Int. Conf. Very Large Scale Integration 2011

Awards, Honors

2010 Withrow Award for Teaching Excellence (Michigan State University)

Best Student Paper, IEEE BioCAS Conference 2010

Peer Reviewed Conferences Publications

X. Mu, D. Rairigh, A. J. Mason, "125ppm Resolution and 120dB Dynamic Range Nanoparticle Chemiresistor Array Readout Circuit," *IEEE Int. Symp. Circuits and Systems*, Rio Brazil, May 2011.

A. M. Kamboh and A. J. Mason, "Channel Characterization for Implant to Body Surface Communication," *IEEE Int. Symp. Circuits and Systems*, Rio Brazil, May 2011.

Y. Huang, A. J. Mason, "Lab-on-CMOS: Integrating Microfluidics and Sensor Arrays on CMOS," *IEEE Int. Conf. Nano/Micro Engineered Molecular Systems*, Feb. 2011.

A. Kamboh, A. J. Mason, "On-Chip Feature Extraction for Spike Sorting in High Density Implantable Neural Recording Systems," *IEEE Biomedical Circuits Systems Conf.*, Cyprus, pp. 13-16, Nov. 2010 (Best Student Paper).

Y. Yang, A. Kamboh, A. J. Mason, "Adaptive Threshold Spike Detection using Stationary Wavelet Transform for Neural Recording Implants," *IEEE Biomedical Circuits Systems Conf.*, Cyprus, pp. 9-12, Nov. 2010.

L. Li, W. Qureshi, X. Liu, A. J. Mason, "Amperometric Instrumentation System with On-chip Electrode Array for Biosensor Application," *IEEE Biomedical Circuits Systems Conf.*, Cyprus, pp. 294-297, Nov. 2010.

L. Li and A. J. Mason, "Post-CMOS Parylene Packaging for On-chip Biosensor Arrays," *IEEE Int. Conf. on Sensors*, pp. 1613-1616, October 2010.

X. Liu, D. Rairigh, A. Mason, "A Fully Integrated Multi-channel Impedance Extraction Circuit for Biosensor Arrays," *IEEE Int. Symp. Circuits and Systems*, Paris France, pp. 3140 – 3143, May 2010.

A. Kamboh, Y. Yang, K. Oweiss, A. J. Mason, "Design of a Configurable Neural Data Compression System for Intra-Cortical Implants," *IEEE Int. Symp. Circuits and Systems*, Paris France, pp. 3473-3476, May 2010.

INVITED LECTURES & SEMINARS

INSPIRE 2010 (*Plenary*): International Conference on information representation and estimation, **University College London**, London, UK, September 8th, 2010

Institute of Neuroscience, **University of Newcastle**, UK, September 9th, 2010

Workshop on **Methods of Information Theory in Computational Neuroscience**, 19th annual Computational Neuroscience, San Antonio, TX, USA, July 30th, 2010

Workshop on **Beyond Brain Machine Interfaces: From Senses to Cognition**, Neural Interfaces Conference, Long Beach, CA, USA, June 19th, 2010

2nd International Conference on **Neuroprosthetic Devices** (ICNPD), Beijing, China, February 27-28, 2010

Department of Neurology seminar series, **University of Georgia**, USA, February 23rd, 2010

PROFESSIONAL ACTIVITIES

Editor, Statistical Signal Processing for Neuroscience & Neurotechnology, 1st edition, Academic Press, 2010

Senior Member, Institute of Electrical and Electronics Engineers (IEEE)

Associate Editor, IEEE Engineering in Med & Biology Conference Editorial Board (CEB): Neural & Rehabilitation Engineering theme, 2010 – 2012

Invited Session, Workshop and Track Chairing

2010   32nd IEEE Engineering in Medicine & Biology Conference: "Analysis of Neural Signals" Track Chair, "Estimation of Brain Connectivity" Session Chair, "Brain Stimulation" Session Chair

2010   4th International meeting on Brain Computer Interface: "Using BCI Systems to Induce Neural Plasticity and Restore Function" Workshop leader

PUBLICATIONS

Books & Dissertations

K. Oweiss, Editor (2010), Statistical Signal Processing for Neuroscience and Neurotechnology, Academic Press, Elsevier, 1st edition, ISBN-13: 978-0-12-375027-3.

Peer-Reviewed Book Chapters

K. Oweiss, M. Aghagolzadeh (2010) "Detection and Classification of Extracellular Action Potential Recordings," in Statistical Signal Processing for Neuroscience and Neurotechnology (Ch.2) - K. Oweiss (Editor), Academic Press, Elsevier, pp. 13-68, ISBN: 978-0-12-375027-3

S. Eldawlatly, K. Oweiss, (2010) "Graphical Models of Functional and Effective Neuronal Connectivity," in Statistical Signal Processing for Neuroscience and Neurotechnology, (Ch. 5) - K. Oweiss (Editor), Academic Press, Elsevier, pp. 119-159, ISBN: 978-0-12-375027-3

Editorials

K. Oweiss, (2010) Statistical Signal Processing for Neuroscience and Neurotechnology, Academic Press, Elsevier, 1st edition, pp. 1-11, ISBN: 978-0-12-375027-3

T. W. Berger, Z. (Sage) Chen, A. Cichocki, K. Oweiss, R. Quian Quiroga, and N. V. Thakor, (2010) "Signal Processing for Neural Spike Trains," Journal of Computational Intelligence and Neuroscience, Volume 2010, Article ID 698751, 2 pages, doi:10.1155/2010/698751

Peer-Reviewed Journal Publications

M. Aghagolzadeh, S. Eldawlatly and K. Oweiss, (2010) "Synergistic Coding by Cortical Neural Ensembles" IEEE Transactions on Information Theory: Special issue on Molecular Biology and Neuroscience, 56:2, pp. 875-899

S. Eldawlatly, Y. Zhou, R. Jin and K. Oweiss, (2010) "On The Use of Dynamic Bayesian Networks in Reconstructing Functional Neuronal Networks from Spike Train Ensembles", Journal of Neural Computation, MIT Press, 22:1, pp. 158-189

S. Eldawlatly, K. Oweiss, (2010), "Causal networks in the rat barrel cortex provide a signature of stimulus encoding," BMC Neuroscience, 11 (Suppl 1):O18, doi:10.1186/1471-2202-11-S1-O18

J. Liu, K. Oweiss and H. Khalil , (2010) "Feedback control of the spatiotemporal firing pattern of a basal ganglia microcircuit model," BMC Neuroscience, 11 (Suppl 1):O16, doi:10.1186/1471-2202-11-S1-O16

International Peer-reviewed Conference Papers

(i) Full publication review

F. Zhang, M. Aghagolzadeh, K. Oweiss, "An Implantable Neuroprocessor for Multichannel Compressive Neural Recording and on-the-Fly Spike Sorting with Wireless Telemetry" in Proc. IEEE Biomedical Circuits and Systems, 2010

J. Liu, K. Oweiss, H. Khalil, "Feedback Control of the Spatiotemporal Firing Patterns of Neural Microcircuits," in Proc. of 49th IEEE Conference on Decision and Control (CDC), 2010

S. Eldawlatly and K. Oweiss, "Causal Networks Provide Functional Signature of Stimulus Encoding in the Rat Barrel Cortex", in Proc. 31st IEEE Eng. in Medicine and Biology (EMBC), 2010

M. Aghagolzadeh, F. Zhang, and K. Oweiss, "An Implantable VLSI Architecture for Real Time Spike Sorting In Cortically Controlled Brain Machine Interfaces, "in Proc. 31st IEEE Eng. in Medicine and Biology (EMBC), 2010

A. Kamboh, Y. Yang, K. Oweiss, A. Mason, "Design of a Configurable Neural Data Compression System for Intra-Cortical Implants," Proc. of IEEE Int. Symp. on Circuits & Systems (ISCAS), pp. 3473– 3476, 2010

(ii) Abstracts & Abstract-reviewed papers

S. Eldawlatly, K. Oweiss, "Stimulus-specific neuronal circuits in the rat somatosensory cortex,"Society for Neuroscience Abstracts, No 782.19, Nov 2010

J. Liu, H.Khalil, K. Oweiss, "Feedback Control of the Spatiotemporal Firing Patterns of a Basal Ganglia Microcircuit Model," Society for Neuroscience Abstracts, No 820.18, Nov 2010

M. Aghagolzadeh, F. Zhang, K. Oweiss, "An implantable architecture for real time unsupervised spike sorting in cortically-controlled brain machine interfaces" Society for Neuroscience Abstracts, No 85.10, Nov 2010

S. Eldawlatly, K. Oweiss, "Causal Networks in the Rat Barrel Cortex Provide a Signature of Stimulus Encoding," 39th Neural Interfaces Conference, Long Beach, CA, Jun 2010

F. Zhang, M. Aghagolzadeh, A. Kamboh, M. Kiani, A. Mason, M. Ghovanloo, and K. Oweiss, "A Wireless and Reconfigurable Compressive Sensing System for Neural Recording in Cortical Brain Machine Interfaces," 39th Neural Interfaces Conference, Long Beach, CA, Jun 2010

M. Aghagolzadeh, F. Zhang, K. Oweiss, "An Implantable VLSI Architecture for Real Time Spike Sorting," 39th Neural Interfaces Conference, Long Beach, CA, Jun 2010

J. Liu, H.Khalil, K. Oweiss, "Feedback Control of the Spatiotemporal Firing Pattern of a Basal Ganglia Microcircuit Model," 39th Neural Interfaces Conference, Long Beach, CA, Jun 2010

K.Y. Kwon, K. Oweiss, "NeuroQuest: A Comprehensive tool for Large Scale Neural Data Analysis," 39th Neural Interfaces Conference, Long Beach, CA, Jun 2010

Christoph Posch (2010-2011)

IEEE Services

Member IEEE CAS Sensory Systems Technical Committee (SSTC)
Member IEEE CAS Neural Systems and Applications Technical Committee (NSATC)

Professional Activities and Service

Review Editor "Frontiers in Neuromorphic Engineering" Journal

Board Memberships:

Review Committee (RC) Member - IEEE International Symposium on Circuits and Systems (ISCAS 2011)
Technical Program Committee (TPC) Member - Asia Pacific Conference on Circuits and Systems (APCCAS 2010)

Awards, Honors, Patents:

AT 502.551 (A1) VERFAHREN UND BILDAUSWERTUNGSEINHEIT ZUR SZENENANALYSE (METHOD AND IMAGE EVALUATION UNIT FOR SCENE ANALYSIS), granted, November 15, 2010.

Publications

Peer Reviewed Papers:

Posch, C.; Matolin, D.; Wohlgenannt, R., "A QVGA 143dB Dynamic Range Frame-free PWM Image Sensor with Lossless Pixel-level Video Compression and Time-Domain CDS", *IEEE Journal of Solid-State Circuits*, vol. 46, no. 1, pp. 259-275, Jan. 2011. (invited)

Chen, D.; Matolin, D.; Bermak A.; and Posch, C., "Pulse Modulation Imaging - Review and Performance Analysis", *Biomedical Circuits and Systems, IEEE Transactions on*, vol. 5, no. 1, pp. 64-82, Jan. 2011.

Posch, C.; Matolin, D.; Wohlgenannt, R., "A Two-Stage Capacitive-Feedback Differencing Amplifier for Temporal Contrast IR Sensors", *Analog Integrated Circuits and Signal Processing Journal*, vol. 64, no. 1, pp. 45-54, 2010. (invited)

Peer Reviewed Conference Papers:

Posch, C.; Matolin, D.; Wohlgenannt, R., "A QVGA 143dB Dynamic Range Asynchronous Address-Event PWM Dynamic Image Sensor with Lossless Pixel-Level Video Compression," *Solid-State Circuits, 2010 IEEE Conference on*, ISSCC, pp. 400-401, Feb. 07-11, 2010.

Posch, C.; Matolin, D.; Wohlgenannt, R., "High-DR, Frame-Free PWM Imaging with Asynchronous AER Intensity Encoding and Focal-Plane Temporal Redundancy Suppression", *Circuits and Systems, ISCAS 2010. IEEE International Symposium on*, May 2010.

Posch, C. *et al.* "Live Demonstration: Asynchronous Time-Based Image Sensor (ATIS) Camera with Full-Custom AE Processor", *Circuits and Systems, ISCAS 2010. IEEE International Symposium on*, May 2010. **ISCAS 2010 Best Live Demonstration Award**

Matolin, D.; Wohlgenannt, R.; Litzenberger, M.; Posch, C., "A Load- Balancing Readout Method for Large Event-Based PWM Imaging Arrays", *Circuits and Systems, ISCAS 2010. IEEE International Symposium on*, May 2010.

Hofstätter, M.; Schön, P.; Posch, C., "A SPARC-Compatible General Purpose Address-Event Processor with 20bit 10ns-Resolution Asynchronous Sensor Data Interface in 0.18μm CMOS", *Circuits and Systems, ISCAS 2010. IEEE International Symposium on*, May 2010.

Delbruck, T.; Linares-Barranco, B.; Culurciello, E.; Posch, C., "Activity- Driven, Event-Based Vision Sensors", *Circuits and Systems, ISCAS 2010. IEEE International Symposium on*, May 2010.

Posch, C. *et al.*, "Biomimetic frame-free HDR camera with event-driven PWM image/video sensor and full-custom address-event processor", *Biomedical Circuits and Systems Conference, 2010. BioCAS, IEEE*, pp.254-257, Nov. 2010.

Posch, C.; Matolin, D., "Sensitivity and Uniformity of a 0.18μm CMOS Temporal Contrast Pixel Array", *Circuits and Systems, ISCAS 2011. IEEE International Symposium on*, May 2011 (accepted for lecture presentation).

Book Chapters

Posch, C., "A Biomimetic Frame-Free Event-Driven Image Sensor", in "Focal-Plane Sensor-Processor Chips", ISBN 978-1441964748, 1st ed., Springer, Berlin, Mar. 2011.

Books

Francisco Serra-Graells (2010-2011)

IEEE Services

Reviewer

IEEE TCAS-I, IEEE TCAS-I, IET EL

Publications

Peer Reviewed Papers

R. Figueras, J. Sabadell, L. Terés and F. Serra-Graells, *A 70um-Pitch 8uW Self-Biased Charge-Integration Active Pixel for Digital Mammography*, IEEE Transactions on Biomedical Circuits and Systems, Accepted

S. Sutula, C. Ferrer and F. Serra-Graells, *A 400uW Hz-Range Lock-In A/D Frontend Channel for Infrared Spectroscopic Gas Recognition*, IEEE Transactions on Circuits and Systems-I, Invited Paper, Accepted

J. Sabadell, R. Figueras, J.M. Margarit, E. Martín, L. Terés and F. Serra-Graells, *A 70umx70um CMOS Digital Active Pixel Sensor for Digital Mammography and X-ray Imaging*, IOP Journal of Instrumentation, Vol.6:3, pp.C03002, Mar 2011

Teresa Serrano-Gotarredona (2010-2011)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Professional Activities and Service

Academic Editor Plos One (http:www.plosone.org)
Member of Review Program Committee: ISCAS
IEEE CAS SSTC Secretary since May 2009 until May 2011
Reviewer: IEEE TCAS I&II, IEEE TNN, ISCAS, NIPS, ECCTD, ICECS
Track Co-Chair for Sensory Systems of the biennial Asia Pacific Conference on Circuits and Systems APCCAS, December 2010

Publications

Peer Reviewed Papers:

J. A. Pérez-Carrasco, B. Acha, C. Serrano, L. Camuñas-Mesa, T. Serrano-Gotarredona, and B. Linares-Barranco, "Fast Vision through Frame-less Event-based Sensing and convolutional Processing. Application to Texture Recognition," *IEEE Trans. Neural Networks,* vol. 21, No. 4, pp. 609-620, April 2010.

Juan Antonio Leñero-Bardallo, T. Serrano-Gotarredona, and B. Linares-Barranco, "A 5-Decade Dynamic Range Ambient-Light-Independent Calibrated Signed-Spatial-Contrast AER Retina with 0.1ms Latency and Optional Time-to-First-Spike Mode," IEEE Trans. on Circuits and systems, Part-I, vol. 57, No. 10, pp. 2632-2643, October 2010.

L. Camuñas-Mesa, A. Acosta-Jiménez, C. Zamarreño-Ramos, T. Serrano-Gotarredona, and B. Linares-Barranco, "A 32x32 Pixel Convolution Processor Chip for Address Event Vision Sensors with 155ns Event Latency and 20Meps Throughput," IEEE Trans. Circ. and Syst. Part-I, vol. 58, No. 4, pp. 777-790, April 2011.

J. A. Leñero-Bardallo, T. Serrano-Gotarredona, B. Linares-Barranco, "A 3.6us Asynchronous Frame-Free Event-Driven Dynamic-Vision-Sensor," IEEE J. of Solid-State Circuits, June 2011.

B. Linares-Barranco, T. Serrano-Gotarredona, L. A. Camuñas-Mesa, Jose A. Perez-Carrasco, C. Zamarreño-Ramos and T. Masquelier, "On Spike-Timing-Dependent-Plasticity, Memristive Devices, and building a Self-Learning Visual Cortex," Frontiers in Neuromorphic Engineering (inaugural issue), 5:26, 2011. doi: 10.3389/fnins.2011.00026 (available from: http://www.frontiersin.org/neuromorphic_engineering/10.3389/fnins.2011.00026/abstract)

C. Zamarreño-Ramos, T. Serrano-Gotarredona, and B. Linares-Barranco, "An Instant-Startup Jitter-Tolerant Manchester-Encoding Serializer/Deserializar Scheme for Event-Driven Bit-Serial LVDS Inter-Chip AER Links," IEEE Trans. Circ. and Syst. Part-I, in Press.

Peer Reviewed Conference Papers:

Camuñas-Mesa, L.; Pérez-Carrasco, J.A.; Zamarreño-Ramos, C.; Serrano-Gotarredona, T.; Linares-Barranco, B.; "On scalable spiking convnet hardware for cortex-like visual sensory processing systems," Proceedings of the 2010 IEEE International Symposium on Circuits and Systems (ISCAS), 2010, Page(s): 249 – 252.

Leñero-Bardallo, J.A.; Serrano-Gotarredona, T.; Linares-Barranco, B.; "A signed spatial contrast event spike retina chip," Proceedings of the 2010 IEEE International Symposium on Circuits and Systems (ISCAS), 2010, Page(s): 2438 – 2441.

Pérez-Carrasco, J.A.; Zamarreño-Ramos, C.; Serrano-Gotarredona, T.; Linares-Barranco, B.; "On neuromorphic spiking architectures for asynchronous STDP memristive systems," Proceedings of the 2010 IEEE International Symposium on Circuits and Systems (ISCAS), 2010, Page(s): 1659 – 1662.

Leñero-Bardallo, J.A.; Serrano-Gotarredona, T.; Linares-Barranco, B.; "A 100dB dynamic range event-driven spatial contrast sensor with 100μs response time and Time-to-First-Spike mode," Proceedings of the ESSCIRC, 2010 , Page(s): 134 – 137.

Camuñas-Mesa, L.; Pérez-Carrasco, J.A.; Zamarreño-Ramos, C.; Serrano-Gotarredona, T.; Linares-Barranco, B.; "Neocortical frame-free vision sensing and processing through scalable Spiking ConvNet hardware," Proceedings of the 2010 International Joint Conference on Neural Networks (IJCNN), 2010 , Page(s): 1 – 8.

Pérez-Carrasco, J.A.; Serrano, C.; Acha, B.; Serrano-Gotarredona, T.; Linares-Barranco, B.; "Spike-Based Convolutional Network for Real-Time Processing," Proceedings of the 2010 20th International Conference on Pattern Recognition (ICPR), 2010 , Page(s): 3085 – 3088.

Book Chapters

Books

Shoushun Chen (2010-2011)

Professional Activities and Service

Conference organization:

Regional liaison co-chair and technical program committee member of IEEE VLSI-SOC 2011.

Editorial Board:

2011- Associate Editor for Sensors Journal

Reviewer:

Journals: IEEE Sensors, IEEE TCAS-II, IEEE TCAS-I, IEEE TVLSI, IEEE TBioCAS,

Publications

Journal papers

Shoushun Chen, Amine Bermak and Wang Yan, "A CMOS Image Sensor With On-Chip Image Compression Based on Predictive Boundary Adaptation and Memoryless QTD Algorithm," IEEE Transactions on Very Large Scale Integration Systems, Volume PP, Issue 99, pp.1-10, Jan. 2010. Conference papers

Conference papers

Xiao-Liang Tan, Anh Tuan Do, Shoushun Chen, Kiat Seng Yeo and Zhi-Hui Kong, "A Comparative Study of State-of-The-Art Low-Power CAM Match-Line Sense Amplifier Designs," accepted at GLSVLSI 2011, Lausanne, Switzerland.

Xiao-Liang Tan, Anh Tuan Do, Shoushun Chen, Kiat Seng Yeo and Zhi-Hui Kong, " A New Match Line Sensing Technique in Content Addressable Memory," accepted at International Symposium on low-power and high-speed chips (cool chip XIV) ,Yokohama Japan, April 20-22, 2011

Bo Zhao and Shoushun Chen, "Realtime Feature Extraction Based on MAX-like Convolutional Network for Human Activity Recognition," accepted at the 2011 IEEE International Symposium on Circuits and Systems (ISCAS), Rio de Janeiro, Brazil.

Anh Tuan Do, Shoushun Chen, Kiat Seng Yeo and Zhi-Hui Kong, "A Low-Power CAM with Efficient Power and Delay Trade-off," accepted at the 2011 IEEE International Symposium on Circuits and Systems (ISCAS), Rio de Janeiro, Brazil.

Anh Tuan Do, Shoushun Chen, Kiat Seng Yeo and Zhi-Hui Kong, "Low IR Drop and Low Power Parallel CAM Design Using Gated Power Transistor Technique," accepted at the IEEE Asia Pacific Conference on Circuits and Systems (APCCAS), Kuala Lumpu, Malaysia, Dec. 2010.

Milutin Stanacevic (2010-2011)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Milutin Stanacevic, Invited Talk, International Symposium on Olfaction and Electronic Nose, May 2011.

Professional Activities and Service

Member of the IEEE CAS Biocas and Sensors Technical Committees
Publication Chair, IEEE Biomedical Circuits and Systems Conference, BioCAS 2011.
Organizing Committee Member, International Symposium on Olfaction and Electronic Nose, ISOEN 2011
Special Session Chair, International Symposium on Olfaction and Electronic Nose, ISOEN 2011
Member of the Technical Program Committee, IEEE BioCAS conference
ETF BAFA Vice President, Scholarship Awards Program
Associate Editor, IEEE Transaction on Biomedical Circuits and Systems

Publications

Peer Reviewed Papers:

X. Yun, M. Stanaćević and S. Luryi, "Low-Power Amplifier for Readout Interface of Semiconductor Scintillator," to appear in *IEEE Transactions on Nuclear Science*

S. Luryi, A. Kastalsky, M. Gouzman, N. Lifshitz, O. Semyonov, M. Stanaćević, A. Subashiev, V. Kuzminsky, W. Cheng, V. Smagin, Z. Chen, J.H. Abeles, W.K. Chan and Z.A. Shellenbarger, "Epitaxial InGaAsP/InP photodiode for registration of InP scintillation", *Nucl. Instr. and Meth. in Phys. Research A*, vol. 622, pp. 113 – 119, 2010.

Peer Reviewed Conference Papers:

J. Jian, M. Stanaćević, S. Einav and R.Fine, "RFID Technology for Monitoring Drug Intake," *Proc. 7th Int. Conf. & Expo on Emerging Technologies for a Smarter World (CEWIT 2010)*, Incheon, Korea, 2010.

E. Salman, A. Doboli and M. Stanaćević, "Noise and Interference Management in 3-D Integrated Wireless Systems," *Proc. 7th Int. Conf. & Expo on Emerging Technologies for a Smarter World (CEWIT 2010)*, Incheon, Korea, 2010.

Chai Wah Wu (2010-2011)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

"Some Aspects of Multicoverage in Sensor Networks", Wireless and Optical Communications Conference, New Jersey Institute of Technology, April 15-16, 2011.

Professional Activities and Service

Member of the IEEE CAS Board of Governors
Member of the IEEE CAS Technical Committee on Cellular Nanoscale Networks and Array Computing
Member of the IEEE CAS Technical Committee on Multimedia Systems and Applications
Member of the IEEE CAS Technical Committee on Nonlinear Circuits and Systems.
Track Chair, Neural Networks and Systems, ISCAS 2011
Session Chair and Organizer, Special Session on Applications and Methodologies for Many-core Platforms, ISCAS 2011

Board Memberships:

Guest Associate Editor, International Journal of Bifurcation and Chaos
Guest Editor, Special Issue: Cellular wave computing via nanoscale chip architectures, International Journal of Circuit Theory and Applications, Volume 38, Issue 9, November 2010, Pages: 883–884
Associate Editor, IEICE NOLTA
Guest Editor, Special Issue on Synchronization, IEICE

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:

C. W. Wu, "Evolution and Dynamics of Complex Networks of Coupled Systems.," IEEE Circuits and Systems Magazine, vol. 10, no. 3, pp. 55-63, 2010.

C. W. Wu, "On graphs whose Laplacian matrix's multipartite separability is invariant under graph isomorphism," Discrete Mathematics, vol. 310, no. 21, pp. 2811-2814, 2010.

C. Liang, Z. Fu, Y. Liu, C. W. Wu, "Incentivized Peer-Assisted Streaming for On-Demand Services," IEEE Transactions on Parallel and Distributed Systems, vol. 21, no. 9, pp. 1354-1367, Sept. 2010.

Peer Reviewed Conference Papers:

D. Smilkov, H. Zhao, P. Dettori, J. Nogima, F. A. Schaffa, P. Westerink, C. W. Wu, "Non-intrusive adaptive multi-media routing in peer-to-peer multi-party video conferencing," Proceedings of IEEE International Symposium on Multimedia (ISM), pp. 105-112, 2010.

C. W. Wu, "On control of networks of dynamical systems," Proceedings of IEEE International Symposium on Circuits and Systems (ISCAS), pp. 3785-3788, 2010.

Book Chapters

Books

Orly Yadid-Pecht (2010-2011)

IEEE Services

Invited Lectures

"Advances in a CMOS Image Sensor based miniature fluorescence Detection System for Bio-medical applications", CMOS ET, Whistler, May 2010.

Other professional activities

Guest Editor, IEEE Sensors Journal Special Issue on Low Power Arrays 2010-2011
Associate Editor, IEEE Transactions on Biomedical Circuits and Systems 2010-2011
Associate Editor, Journal of Low Power Electronic Applications (JLPEA) of Elsevier 2010-2011
Associate Editor, IEEE Technology News (ITN) 2010-2011
Member of the IEEE CAS 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 BioCAS conference (2004-present).
Member of the Steering Committee for the IEEE ICECS (2003-present).
Member of the IEEE CAS Women in Engineering Committee.

Board Memberships:

Board Member, IEEE Sensors Council 2010

Awards and Honors

2010   RC Strategic Grant

Publications

Peer Reviewed Papers:

Q. Gao, O. Yadid-Pecht, "A Low Power Block Based CMOS Image Sensor with Dual VDD", IEEE Sensors Journal, Special Issue on Design Methods for Low Power Arrays.   Accepted.

N. Kopeika, O. Yadid-Pecht, "Inexpensive THz focal plane array imaging using miniature neon indicator lamps as detectors", IEEE Sensors Journal, January 2011. Accepted.

T. Sandhu, O. Yadid-Pecht, "New Memory Architecture for Rolling Shutter Wide Dynamic range CMOS Imagers". IEEE Sensors, Special Issue on Low Power Arrays. Accepted.

D. Filip, O. Yadid-Pecht, C.N. Andrews, M.P. Mintchev, "Self-stabilizing Colonic Capsule Endoscopy: Pilot Study of Acute Canine Models", IEEE Transactions on Medical Imaging. Accepted.

A.Spivak, A. Belenky, A. Fish, O. Yadid-Pecht, "Wide Dynamic Range CMOS Image Sensor with Gating for Night Vision Systems" IEEE Transactions on Circuits and Systems II. Accepted.

A.Spivak, A. Teman, A. Belenky, O. Yadid-Pecht, A. Fish, "Power-Performance Tradeoffs in Wide Dynamic Range Image", Journal of Low Power Electronics and Applications. Accepted.

D. Rozban, A. Levanon, H. Joseph, A. Akram, A. Abramovich, N.S. Kopeika, Y. Yitzhaky, A. Beleneky, O. Yadid-Pecht, "Inexpensive THz focal plane array imaging using neo indicator lamps as detectors", IEEE Sensors Journal, Accepted.

Y. Shoshan, A. Fish, G.A. Jullien, O. Yaddid-Pecht, "Hardware Implementation of Digital Watermark for Forensic Applications", IEEE Transactions on Information Forensics & Security. Accepted.

A.Razavi, M. Amtoun, O. Yadid-Pecht, G.A. Jullien, "A Camera Simulation Framework for Passive Depth Recovery Systems", IEEE Transactions on Photonics Journal, pp. 894-903, September 2010.

A.Teman, O. Yadid-Pecht, A. Fish, "Large VLSI Arrays – Power and Architectural Perspectives", International Journal "Information Technologies and Knowledge", Vol. 4, No. 1, pp. 76-88, September 2010.

L. Blockstein, O. Yadid-Pecht, "Crosstalk quantification, analysis and trends in CMOS image sensors", OSA Applied Optics, Vol. 49, Issue 24, pp. 4483-4488, July 2010.

Y. Dattner, O. Yadid-Pecht, "Low Light CMOS Contact Imager with an integrated Poly-Acrylic Emission Filter for Fluorescence Detection", Sensors Journal, Vol. 10, pp. 5014-5027, May 2010.

Peer Reviewed Conference Papers:

Q. Gao, O. Yadid-Pecht, "Dual VDD Block Based CMOS Image Sensor – Preliminary Evaluation", ISCAS 2011, Rio de Janeiro, Brazil, May 2011. Accepted.

A.Spivak, A. Belenky, A. Fish, O. Yadid-Pecht, "CMOS Image Sensor with Gating – analysis" IEEE International Image Sensor Workshop 2011, June 2011, Hokkaido, Japan. Accepted.

N.S. Kopeika, A. Abramovich, O. Yadid-Pecht, Y. Yitzhaky, A. Levanon, D. Rozban, H. Joseph, A. Akram, A. Belenky, "Inexpensive Imaging at Millimeter Wave and Terahertz Frequencies Using Miniature Neon Lamp Plasma Focal Plane Arrays", Photonica 2011, August 2011. Moscow, Russia. Accepted. Invited.

N.S. Kopeika, A. Abramovich, O. Yadid-Pecht, a. Levanon, H. Joseph, D. Rozban, Y. Yitzhaky, A. Akram, A. Belenky, "Inexpensive focal plane array detection and imaging of mm wave and THZ radiation using neo indicator lamps", 2011 XXXth URSI General Assembly and Scientific Symposium, August 2011. Istanbul, Turkey. Accepted.

D. Filip, O. Yadid-Pecht and M.P. Mintchev, "Progress in Self-stabilizing Capsules for Imaging of the Large Intestine", IEEE International Conference on Electronics, Circuits and Systems, CD ROM, December 2010.

Y. Dattner, O. Yadid-Pecht, "A variable topology partitioned pixel amplifier for low and high light level detection in a CMOS imager", IEEE Sensors Conference, Hawaii, pp. 512-516, November 2010

Jie Yuan (2010-2011)

IEEE Services

IEEE CAS BioCAS TC Vice Chair since May 2010
Members of IEEE SSTC, ASPTC since March 2011

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Invited speaker at the CMOS Emerging Technologies Workshop, Whistler, Canada, 2010. Talk title: "Wide dynamic range CMOS imaging sensor for bio-medical imaging".

Invited Speaker at International Conference of Sampling Theory and Applications (SAMPTA), Singapore, 2-6 May 2011,. Talk title: "A 12-bit 20MS/s 56.3mW pipelined ADC with interpolation-based nonlinear calibration".

Professional Activities and Service

Guest Associate Editor for IEEE Trans. Biomedical Circuits and Systems, Dec. 2010.
TPC members, IEEE International Conference on VLSI and System-on-chip, 2010/2011

Board Memberships:

Finance Chair, IEEE International Conference on VLSI and System-on-chip, 2011

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:

R. Xu, H. Zhu, and J. Yuan, "Electrical-field intra-body communication channel modeling with finite element method", IEEE Trans. on Biomedical Engineering, Vol. 58, pp. 705-712, Mar. 2011.

J. Yuan, and H.Y. Chan, "Power analysis and design of wide dynamic range CMOS imaging sensors", Microelectronics Journal, Vol. 41, pp.585-593, Sep. 2010

J. Yuan, K.L.Tsang, "The Design and Optimization Methodology of A Low-Distortion sub-uW Sample-and-Hold Stage for Weak Bio-Currents", Microelectronics Journal, Vol. 41, pp. 121-128, Feb./Mar., 2010

Peer Reviewed Conference Papers:

J. Yuan, S. W. Fung, and K. Y. Chan, "A 12-bit 20MS/s 56.3mW pipelined ADC with interpolation-based nonlinear calibration", International Conf. Sampling Theory and Applications, Singapore, May, 2011, invited

B. Liu, and J. Yuan, "A highly linear monolithic CMOS detector for computed tomography", 2011 International Symposium on VLSI Design, Automation & Test (VLSI-DAT), Hsinchu, Taiwan, accepted

J. Guo, and J. Yuan, "A highly linear wide dynamic range detector for cell recording with microelectrode arrays", 2010 IEEE International conference on VLSI and System-on-chip (VLSI-SOC), pp. 179-182, Madrid, Spain, 2010

J. Yuan, "Wide dynamic range CMOS imaging sensor for bio-medical imaging", CMOS Emerging Technologies, Whistler, Canada, 2010

Book Chapters

Books

Mona Zaghloul (2010-2011)

IEEE Services

Conferences or workshops where the NSA TC or members of the TC were actively involved in 2010-2011 include the following:

Member of the IEEE Technical Committee for IEEE Sensors Conference, 2010, 2011.

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures:

Distinguished Lecturer in 2010-2011:

Editorial Service:

Other IEEE Service:

Member of the IEEE Fellow Committee for the IEEE Sensors Council
Past President for IEEE Sensors Council 2010-2011
Chair of the nomination Committee for IEEE Sensors Council 2010-2011

Awards, Honors, and Patents:

Distinguished Research Award 2010, School of Engineering and Applied Science, The George Washington University, Washington DC, AY 2010-2011.

Publications (Journal Articles, Conference Papers, Books, Book Chapters):

Journal Articles

Farmer, T.J., Darwish, A., Zaghloul, M.E., "A 2.4 GHz SiGe HBT High Voltage/High Power Amplifier", IEEE Microwave and Wireless Components Letters, Volume 20,Number 5,pp 286-288, May 2010.

Hsu-Cheng Ou; Zaghloul, M., "Synchronous One-Pole LiNbO3 Surface Acoustic Wave Mass Sensors," IEEE *Electronic Device Letters, Volume 31, Number 5, pp 518-520, May* 2010.

M. Taghioski, J. Perlow, M.E. Zaghloul, and A. Montaser, "Generation of Ultra High Frequency Air Micro Plasma Loop and Effects of Amplitude Modulation on Operation", Applied Physics Letters, 96, 191502, May 2010.

A.N. Nordin, M.Zaghloul,,"RF Oscillator Implementation Using Integrated CMOS Surface Acoustic Wave Resonators", Analog Integrated Circuits and Signal Processing, Springer , February 2011.

C Chang, D. Nagel, M.Zaghloul, "Computational Methodology for Absolute Calibration Curves for Microfluidic Optical Analyses", Sensors , 2010;10(7):6730-6750,http://www.mdpi.com/1424-8220/10/7/6730.

C. Chang,D.Nagel, M.Zaghloul,"Irradiance Dependance of Photobleaching of Resorufin", Journal of Photochemistry and Photobiology A: Chemistry, available on line http ://dx.doi.org/10.1016/j.photochem.201011.008, to appear 2011

R. Proie,T. Ivanov,R. Polcawich, J. Pulskamp, M.E.Zaghloul, "DEVELOPMENT OF A PZT MEMS SWITCH ARCHITECTURE FOR LOW-POWER DIGITAL Applications ", Accepted to appear IEEE Journal of Microelectromechanical Systems, to appear 2011.

T. Farmer, A. Darwish, B. Huebschman, E. Viveiros, E. Hung. M.E. Zaghloul, ," High Power Density SiGe Millimeter –Wave Power Amplifiers" Accepted to appear in the International Journal of Microwave and Wireless Technologies, to appear 2011.

C. Chang, D. Nagel, M. Zaghloul, "Compact Optical Microfluidic Uric Acid Analysis System ", accepted to Biosensors and Bioelectronics Journal, Springer, to appear 2011.

Conference Papers

O. Tigli, M. Zaghloul, " Finite Element Modeling and Analysis of CMOS-SAW Sensors", Nanotech Conference& Expo, June 21-24, Anaheim, CA, 2010.

O. Tigli, M. Zaghloul, "Surface Acoustic Wave (SAW) Biosensors " Invited to Special Session in the IEEE MWSCAS10, August 2010.

B. Zhang, M. E. Zaghloul, "Design Of Surface Acoustic SAW Filters with low Insertion Loss", IEEE MWSCAS10, August 2010.

B. Zhang, C.E. Korman, M.E. Zaghloul, "Novel Hall Effect CMOS Sensor" IEEE Sensors Conference, October 2010.

Marjan Nabili, Mohammedreza, Sankara Meesh, Ji Liu, David Beylyea, Craig Geist, Vesna Zderic, Mona Zaghloul, "Surface Acoustic Wave Devices for Ocular Drug Delivery", IEEE Ultrasonic Conference December 2010.

A. Gupta, S. Ahmadi, M.E. Zaghloul, "A 400 MHz Delta –Sigma Modulator for band pass IF Digitization Around 100MHz with Excess Loop Delay Compensation", IEEE Proceedings of the International Circuits and Systems Conference, ISCAS, Rio De Janeiro, Brazil, May 2011.

R. Proie, J. Pulskamp, R. Polcawich, T. Ivanov, M. E. Zaghloul, " Low power 3-Bit Piezoelectric MEMS Analog To Digital Converter", MEMS 2011, Cancun, MEXICO, January 23-27, 2011, pp 1241-1344.

R. Proie, R. Polcawich, J. Pulskamp, T. Ivanov, M. Zaghloul, " NANO-Electromechanical Storage Element for Low Power Complementary Logic Architecture Using PZT Switches', Transducers 2011, June 5-9, 2011, Beijing, China.

R. Proie, R. Polcawich, J. Pulskamp, T. Ivanov, M. Zaghloul, "High Speed Single Cycle Resolution Reliability System for RF-MEMS Switches", IEEE International Microwave Symposium, Baltimore June 5-10 2011.

R. Proie, R. Polcawich, J. Pulskamp, T. Ivanov, M. Zaghloul, "Development of a PZT MEMS Switch Architecture Intended for Low Power Digital Applications", Proceedings of GOMACTech 2011, Government Microcircuit Applications and Critical Technology Conference, Orlando, FL, March 21-24, 2011.

T. Farmer, A. Darwish,E. Viveiros, A. Hung, M.E.Zaghloul, " Device Architecture for Millimeter –Wave Power Amplifiers Using SiGe HBTs", Proceedings GOMACTech 2011, Government Microcircuit Applications and Critical Technology Conference, Orlando, FL, March 21-24, 2011.

T. Farmer, A. Darwish,E. Viveiros, A. Hung, M.E.Zaghloul," SiGe HBT Stacked Power Amplifier at Millimeter Wave ",Proceedings GOMACTech 2011, Government Microcircuit Applications and Critical Technology Conference, Orlando, FL, March 21-24, 2011.

M. Taghioskoui, M. Zaghloul, A. Montaser, " Tongue-Shaped Ultrahigh Frequency Atmospheric Pressure Plasma Jet", proceedings of IEEE International Conference on Plasma Science(ICOPS), Chicago, Il, June 2011.

Books and Book Chapters