Sensory Systems Technical Committee Annual Report

IEEE Circuits and Systems Society
Activities for May 2009 through April 2010

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 2010, Paris, France, Disney's hotel New York – Convention Centre, Room "**Grand Central Station I**", Monday, May 31st 2010 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 54 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 Taiwan, 19 TC members were present, 2 non members, and 6 new candidate members. The SSTC welcomed the 6 new members last year (Tara J. Hamilton, Mohamad Sawan, Jie (George) Yuan, Chen Shoushun, Walter D. Leon-Salas, and Jonne Powonen). Thus, last year attendance was 25 of a total of 54 members, representing an approximate attendance rate of 50%).

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 74 submissions at ISCAS 2010 (12% more than last year). Three to six reviews were arranged for each paper. RCM assignments were closely monitored to guarantee reviewers were fairly spread over several institutions and countries. With 7 Sensory System Sessions (5 oral, 2 posters), we had 35 accepted (47% acceptance rate).

The SSTC members have organized a number of ISCAS 2010 Special Sessions this year:

1) Adaptive Convolutional Neural Networks, Theory, Hardware & Applications

Chairs: Bernabe Linares-Barranco, Eugenio Cullurciello
2) Biologically Inspired Speech Processing
Chairs: Shih-Chii Liu, John Harris

3) Neuromorphic Nano Devices Adaptive Sensing & Processing Systems
Chairs: Teresa Serrano-Gotarredona, Christian Gamrat

4) Analog Neuromimetic VLSI: An Alternative Strategy to Investigate Biological Neural Systems
Chairs: Sylvain Saïghi, Paul Hasler

5) Activity-Driven, Event Coding Vision Sensors
Chairs: Tobi Delbruck, Bernabe Linares-Barranco

One SSTC member has organized a tutorial for this year ISCAS:

- Analog/Digital and Hybrid Bio-Silico Circuits for Hardware Neurons, synapses, and Spiking Neural Networks. G. Indiveri.

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 second time as a regular ISCAS track, co-organized by SSTC members Tobi Delbrück and Philipp Häfliger. This year there are 14 demo papers, to be exposed without interfering with the Posters, on 4 separate "Time Squares", on 2 days (Monday and Tuesday afternoon).

Best Paper Award:

The 10 best papers in the Sensors track (according to the review scores) were selected by the TC 2009 Sensory Systems track chair (Dr. Linares-Barranco) based on the feedback on all papers from the reviewers and Review Committee Members. These papers were then re-examined by the technical committee officers and members, Drs. Linares-Barranco, Delbrück, Serrano-Gotarredona, Dudek, and in addition, 8 other committee members, each examining 5 papers, so that each paper would receive 6 reviews. Examining of a (co-)author's paper by the author was avoided. Each examiner ranked the 5 papers assigned with the best ranked paper receiving 5 points and the lowest ranked paper 1 point. The paper's points were tallied and the highest scoring paper has been selected as the best Sensory Systems track paper for 2010. The second highest scoring paper has been selected for receiving a honorary mention.

This year, the winning and honorary mention papers will be announced at the annual meeting. The winning papers will then be reported in the 2010 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
- EURASIP Journal on Advances in Signal Processing
- Journal of Computational Intelligence and Neuroscience

4. Out Reach:

Members of our TC serve on program committees of various conferences such as SPIE, NIPS, ISSCC, ICECS, BICS, ESSCIRC, Sensors, bioCAS, IMS3TW, TNCEW, CCCNEW, MRCIIS, EMBC, IMSSSTW, ICANN, etc., and 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 TCAS, Sensors, JSSC, TVLSI, TBioCAS, FNE, TNN, PlosOne, CC, AANS, SPL, JCIN, etc.

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

One SSTC member served as tutorial presenter in the 2009 IEEE BioCAS Conference.

SSTC members organized special sessions in conferences on different areas:
- Special session on Circuits and Systems activity in Life science area at IEEE/NIH LiSSA 2009
- Special session on Design Methodologies for Low Power Sensory and Memory Arrays in the IEEE Sensors Conference
- Special Live Demo Session at International Workshop on Cellular Nanoscale Neural Networks and Applications, CNNA 2010, Berkeley

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 hosted by the IEEE at
http://www.ewh.ieee.org/soc/icss/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. Timothy Constandinou, Imperial College London, t.constandinou@ic.ac.uk
11. Eugenio Culurciello, Yale University, eugenio.culuriello@yale.edu
12. Tobi Delbruck, University of Zurich and ETH Zurich, tobi@ini.phys.ethz.ch
13. Piotr Dudek, University of Manchester, United Kingdom, p.dudek@manchester.ac.uk
14. Ralph Etienne-Cummings, Johns Hopkins University, retienne@jhu.edu
15. Wai-Chi (Winston) Fang, National Chiao Tung University, wfang@mail.nctu.edu.tw
16. Alexander Fish, ATIPS labs, fish@atips.ca
17. Roman Genov, University of Toronto,Canada, roman@eecg.toronto.edu
18. Maysam Ghovanloo, Georgia Institute of Technology, mghovan@ece.gatech.edu
19. Viktor Gruev, University of Pennsylvania, vgruev@seas.upenn.edu
20. Martin Haenggi, University of Notre Dame, mhaenggi@nd.edu
21. Philipp Hafliger, University of Oslo, Norway, hafliger_at_ifi.uio.no
22. Tara J. Hamilton, University of Queensland, tara@itee.uq.edu.au
23. John Harris, University of Florida, harris@cnel.ufl.edu
24. Paul Hasler, Georgia Institute of Technology, phasler@ece.gatech.edu
25. Arjang Hassibi, University of Texas, arjang@mail.utexas.edu
26. Timothy Horiuchi, University of Maryland, timmer@isr.umd.edu
27. Zeljko Ignjatovic, Univ of Rochester, ignjatov@ece.rochester.edu
28. Giacomo Indiveri, University of Zurich and ETH Zurich, giacomo@ini.phys.ethz.ch
29. Ce Kuen Shieh, National Cheng Kung University, shieh@ee.ncku.edu.tw
30. Tor Sverre Lande, University of Oslo, bassen@ifi.uio.no
31. Walter D. Leon-Salas,University of Missouri, leonsalasw@umkc.edu
32. Bernabe Linares-Barranco, Sevilla Microelectronics Institute, bernabe@imse-cnm.csic.es
33. Shih-Chii Liu, University of Zurich and ETH Zurich, shih@ini.phys.ethz.ch
34. Dimitrios Loizos, Univ. of California, San Diego & NetLogic Microsystems, Inc., dloizos@netlogicmicro.com
35. Franco Maloberti, University of Pavia, Italy, franco.maloberti@unipv.it
36. Andrew Mason, Michigan State University, mason@msu.edu
37. Karim Oweiss, Michigan State University, koweiss@msu.edu
38. Jonne Poikonen, University of Turku, jokapo@utu.fi
39. Christoph Posch, Austrian Research Centers, christoph.posch@arcs.ac.at1

40. Khaled Salama, Rensaleer Polytechnic Institute, khaled@ecse.rpi.edu
41. Mohamad Sawan, Polytechnique Montreal, mohamad.sawan@polymtl.ca
42. André van Schaik, Sydney University, andre@ee.usyd.edu.au
43. Teresa Serrano-Gotarredona, Sevilla Microelectronics Institute, terese@imse-cnm.csic.es
44. Bertram Shi, Hong Kong University of Science and Technology, eebert@ee.ust.hk
45. Chen Shoushun, Nanyang Tech. Univ. (NTU) Singapore, eechenss@ntu.edu.sg
46. Milutin Stanacevic, SUNY, Stonybrooke, milutin@ece.sunysb.edu
47. John Tapson, Univ. of Cape Town, Jonathan.Tapson@uct.ac.za
48. Orly Yadid-Pecht, Ben-Gurion University, oyp@ee.bgu.ac.il
49. yuJie (George) Yuan, Hong Kong Univ. Science & Techn., eeyuan@ust.hk
50. Jacob Vogelstein, Johns Hopkins University, jacob.vogelstain@jhuapl.edu
51. Denise Wilson, University of Washington, denisew@u.washington.edu
52. Peter (Chung-Yu) Wu, National Chiao Tung University, cywu@alab.ee.nctu.edu.tw
53. Mona Zaghloul, George Washington University, zaghloul@gwu.edu
54. Akos Zarandy, Hungarian Academy of Sciences, zarandy@sztaki.hu

Appendix B: member activities

Of the 54 members at the end of this period (including the 6 new members added at last annual meeting), 27 submitted activity reports.

Amine Bermak (2009-2010)

IEEE Services

Professional Activities and Service

General Chair of the IEEE International Conference on Biomedical Circuits and Systems IEEE BioCAS 2009 held in Beijing.
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 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.

Awards, Honors, Patents:

2009 School of Engineering teaching Excellence Award
"Self-integrating Energy Harvesting CMOS image Sensor," US Patent, Submitted.
"Photo-Aligned Liquid-Crystal Micropolarimeter Array and Its Manufacturing Method," US/China Patent, Submitted.

Publications

Peer Reviewed Papers:

Milin Zhang and A. Bermak, "Compressive Acquisition CMOS Image Sensor --From Algorithmic Solution to Hardware Implementation" *IEEE Transactions on Very Large Scale Integration Systems*, Accepted.
Chao Shi, Man Kay Law and A. Bermak, "A Novel Asynchronous Pixel for Energy Harvesting CMOS Image Sensor" IEEE Transactions on Very Large Scale Integration Systems Accepted.
S. Chen, and A. Bermak, "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 Accepted.
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*, Accepted.
X. Zhao, A. Bermak, F. Boussaid, T. Du, V. G. Chigrinov, "High-resolution photo-aligned liquid-crystal micropolarizer array for polarization imaging in visible spectrum," *Optics Letters*, vol. 34, issue 23, pp. 3619-3621, Dec. 2009.
M. K. Law and A. Bermak, "A 405nW CMOS Temperature Sensor based on Linear MOS Operation", *IEEE Transactions Circuits and Systems II (TCAS-II)*, pp. 891 - 895 Dec. 2009
Xiaojin Zhao, Amine Bermak, Farid Boussaid*, and Vladimir G. Chigrinov "Thin PhotoPatterned Micropolarizer Array for CMOS Image Sensors, IEEE Photonics Technology Letters, vol. 21, no. 12, pp. 805-807, 2009.
A.B. Far, F. Flitti, B. Guo, and A. Bermak, "A Bio-inspired Pattern recognition System for tin oxide gas sensor applications *IEEE* Sensors Journal, Vol. 9, Issue 6, June 2009.
X. Li, M. Zhang, Z. Wang, A. Bermak, "A Smart Image Sensor Integrating Low Complexity Image Processing for Wireless Endoscope Capsule", Tsinghua Science and Technology Journal, Volume 14, Issue 5, Pages 586-592, October 2009

Peer Reviewed Conference Papers:

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, Paris (accepted).

4. Xiaoxiao Zhang, Amine Bermak, and Farid Boussid, "Dynamic Voltage and Frequency Scaling for Low-power Multi-precision Reconfigurable Mutiplier" accepted to IEEE International Symposium on Circuits and Systems, ISCAS, Paris (accepted).

S. Léomant, Xiojin Wu and A. Bermak, "A Single Bit Memory per Pixel Time Domain DPS using Multi-Reset Integration Scheme", ISCAS, Paris, (accepted).

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), (accepted).

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), Paris, (accepted).

Fang Tang, Amine 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, (accepted)

Yuan CAO, Amine Bermak, Thinh Le. "A Smart Hot Pixel Correction Read Out for the CMOS Image Sensor in Biomedical Applications", DELTA, (accepted).

Qingzheng LI, Guixuan LIANG and Amine BERMAK, "A High-speed 32-bit Signed/Unsigned Pipelined Multiplier" IEEE International Symposium on Electronic Design, Test & Applications, DELTA (accepted).

K. L. Lau, S. Léomant, and A. Bermak, "A Hybrid CMOS DPS with Conditional Data Readout Scheme", DELTA, (accepted).

Hung Tat Chen, Amine Bermak, Dominique Martinez, Smellphone: odour recognition with a cellular phone, ISOEN2009, International Symposium on Olfaction and Electronic Nose, Brescia/Italy 2009.

K. T. Ng, B. Guo, A. Bermak, D. Martinez, and F. Boussaid, "Characterization of a logarithmic spike timing encoding scheme for a 4x4 tin oxide gas sensor array," in IEEE Sensors, 2009, New Zealand, Oct. 2009.

C. Shi, M. K. Law and A. Bermak, "A CMOS image sensor with reconfigurable resolution for energy harvesting applications," IEEE Sensor Conference, pp. 197-200, Oct. 2009.

Fang Tang, Amine Bermak, "Low Power Current-Mediated CMOS Imagers with Linear Current Output," Asia Symposium on Quality Electronic Design, ISQED-ASIA'09, pp. 284-287, ASQED 2009.

Fang Tang, Amine Bermak, "A Programmable Compact Control Mechanism for Ultra-Low Power Current-Mediated CMOS Imagers," Asia Symposium on Quality Electronic Design, ISQED-ASIA'09, pp. 280-283, ASQED 2009.

X. Wu, X. Zhao, A. Bermak and F. Boussaid, "An AER based CMOS polarization image sensor with photo-aligned micropolarizer array", Asia Symposium on Quality Electronic Design, pp. 126-130, Kuala Lumpur, 2009.

Xiaoxiao Zhang; Bermak, A.; Boussaid, F, "Power Optimization in Multipliers using multi-precision combined with voltage scaling techniques", Quality Electronic Design, 2009. ASQED 2009, Pages(s): 79-82, July 2009.

Milin Zhang and Amine Bermak, "Architecture of a Digital Pixel Sensor Array Using 1-bit Hilbert Predictive Coding", ISCAS2009, IEEE International Symposium on Circuits and Systems, Taipai, Taiwan 2009.

Zhao, A. Bermak, F. Boussaid, L. Yao and V. G. Chigrinov, "A High-Resolution Micro-Circular-Polarization-Analyzer Array for Real-Time Active Circular Polarization Imaging", the proceedings of IEEE Biomedical Circuits and Systems Conference (BioCAS), Beijing, 2009.

Faycal Benrekia, Mokhtar Attari and A. Bermak, "FPGA Implementation of a Neural Network Classifier for Gas Sensor Array Applications" Sixth IEEE International Multi-Conference on Systems, Signals and Devices" SSD 09, Djerba, Tunisia, 2009.

Kwan Ting Ng, Hung Tat Chen, Farid Boussaid*, A. Bermak, and Dominique Martinez A Robust Spike-Based Gas Identification Technique for SnO2 Gas Sensors ISCAS2009, IEEE International Symposium on Circuits and Systems, Taipai, Taiwan 2009.

M. Zhang, A. Bermak, "Compressive Acquisition CMOS Image Sensor Using On-line Sorting Scheme", International SoC Design Conference 2009, ISOCC 2009. pp. 169 - 172, 22-24 Nov. 2009.

M. Zhang, A. Bermak, "Digital Pixel Sensor with On-line Spatial and Temporal Compression Scheme", ISIC 2009, 12th International Symposium on Integrated Circuits. 14-16 Dec. 2009.

M. Zhang, A. Bermak, "Does the Scanning Pattern affect adaptive Quantization Processing?" ISIC 2009, 12th International Symposium on Integrated Circuits. 14-16 Dec. 2009.

Book Review

CMOS Mixed-Signal Circuit Design, R. Jacob Baker, IEEE Press, Wiley, Second Ed, 09.

Shantanu Chakrabartty (2009-2010)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Plenary Session, ``Intelligence Everywhere but where is it going ?" *Pattern Recognition and Machine Intelligence (PReMI09),* Indian Institute of Technology, Delhi, Dec. 2009.

Short Course, ``Designing Microsystems that Learn", *Pattern Recognition and Machine Intelligence (PReMI09),* Indian Institute of Technology, Delhi, Dec. 2009

Invited Talk, ``Forward Error Correcting Biosensors", *CMOS Emerging Technologies Workshop*, Sep. 2009.

Professional Activities and Service

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

Proposal Review Panelist
- National Science Foundation, CMMI, 2010
- Dutch Technology Foundation STW, 2009.

Board Memberships:

Associate Editor, Advances in artificial neural systems, Hindawi Publications.

Review Editor, Frontiers in Neuromorphic Engineering.

Program Committee Member :
- 22nd Symposium on Integrated Circuits and Systems Design, 2009
- IEEE Biomedical Circuits and Systems Conference, 2009.
- IEEE International Mixed-Signals, Sensors, and Systems Test Workshop (IMS3TW 2010)

Awards, Honors, Patents:

- *National Science Foundation CAREER Award, 2010*

- S. Chakrabartty, ``*Multiple-input Multiple-output Analog-to-digital Converter''*, US Patent no: 7,479,911, Issued Jan. 20, 2009.

Publications

Peer Reviewed Papers:

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, DOI: 10.1109/TSP.2009.2034909.

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, 2009.

C.Huang, N.Lajnef, S. Chakrabartty*, ``Calibration and Characterization ofSelf-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, DOI: 10.1109/TCSI.2009.2024976.

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, DOI: 10.1109/TCSI.2009.2025002.
.

Peer Reviewed Conference Papers:

C. Huang, N. Lajnef, S.Chakrabartty, `` Infrasonic energy harvesting for embedded structural health monitoring micro-sensors'', *Proc. of SPIE Smart Structures and Materials + Non-destructive Evaluation and Health Monitoring,* San Diego, March 2010 (To appear).

S.Chakrabartty, ``Multiple-input multiple-output (MIMO) analog-to-feature converter chipsets for sub-wavelength acoustic source localization and bearing estimation'', *Proc. of SPIE Symposium on Defense, Security and Sensing,* Orlando, April 2010 (To appear).

M. Gu, K. Misra, H. Radha, S. Chakrabartty, ``Sparse Decoding of Low-density Parity Check Codes based on Margin Propagation'', *Proc. of IEEE Globecomm*, Honolulu, HI, 2009.

Y. Liu, E. Alocilja, S. Chakrabartty, ``Exploiting Sub-Threshold and Above-Threshold Characteristics in a Silver-Enhanced Gold Nanoparticle Based Biochip'', Proc. of *IEEE Conference on Engineering in Medicine and Biology,* Minneapolis, 2009.

Y. Liu, E. Alocilja, S. Chakrabartty, ``Co-detection in Forward Error Correcting Biosensors'', *Nano-DDS Conference,* FL, 2009.

Y. Liu, E. Alocilja, S. Chakrabartty, ``Time-based Forward Error Correcting Biosensors'', *Nano-DDS Conference,* FL, 2009.

A. Fazel, S. Chakrabartty, ``Non-Linear Filtering in Reproducing Kernel Hilbert Spaces for Noise-Robust Speaker Verification'', *Proc. of IEEE International Symposium on Circuits and Systems (ISCAS)*, Taipei, Taiwan, 2009.

Y. Liu, D. Zhang, E. C.Alocilja, and S. Chakrabartty, `Design and Characterization of a Silver-Enhanced Gold Nanoparticle-Based Biochip'', *Proc. of IEEE International Symposium on Circuits and Systems*, Taipei, Taiwan, 2009.

N. Lajnef, C. Huang and S. Chakrabartty, `Infrasonic Power-Harvesting and Nanowatt Self-Powered Sensors'', *Proc. of IEEE International Symposium on Circuits and Systems*, Taipei, Taiwan, 2009.

S. Chakrabartty and A.Gore, ``Sigma-Delta Analog to LPC Feature Converters for Portable Recognition Interfaces'', *Proc. of IEEE International Symposium on Circuits and Systems*, Taipei, Taiwan, 2009.

C. Huang and S. Chakrabartty, ``Reducing Indirect Programming Mismatch Due to Oxide-Traps Using Dual-Channel Floating-Gate Transistors'', *Proc. of IEEE International Symposium on Circuits and Systems*, Taipei, Taiwan, 2009.

M. Shi, A.Abbas, S. Chakrabartty and G. Cauwenberghs, ``An Analog Wavelet Transform CMOS APS Imager Chip'', *Proc. of IEEE International Symposium on Circuits and Systems*, Taipei, Taiwan, 2009.

Book Chapters

Books

Timothy G Constandinou (2009-2010)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Professional Activities and Service

Member of the IEEE CAS BioCAS and Sensors Technical Committees (2006 – present).
Member of the Technical Committee for the IEEE BioCAS Conference (2007 – present).

Board Memberships:

Guest Editor, IEEE Transactions on Biomedical Circuits & Systems, Special Issue on IEEE ISCAS- Taipei, Taiwan. (2009)
Technical Program and Publications Chair, IEEE International Conference on Biomedical Circuits & Systems (2010).
IET Awards Committee Member (2010 – 2013).

Awards, Honors, Patents:

Recipient of 2009 IET Mike Sargaent Career Achievement Award, presented to the Young Professional who is judged to have made the most significant progress in their career over a number of years.

Patents:

TG Constandinou, S Reed, P Georgiou, C Toumazou, "Method of integrating CMOS/microfluidic components in lab-on-chip assemblies", UK IPO, 2010.

TG Constandinou, P Georgiou, T Prodromakis, C Toumazou, "Sensors and Sensing", UK IPO, 2010.

TG Constandinou, K Nikolic, C Toumazou, "Method and Apparatus for Optically Outputting Information from a semiconductor Device", UK IPO (KS.P48317GB), 2010.

Publications

Peer Reviewed Papers:

T Prodromakis, Y Liu, TG Constandinou, P Georgiou, C Toumazou, "Exploiting CMOS Technology to Enhance the Performance of ISFET Sensors", IEEE Electron Devices Letters, accepted- in press, 2010.

Peer Reviewed Conference Papers:

TG Constandinou, P Georgiou, T Prodromakis, C Toumazou, "A CMOS-based Lab-on-Chip Array for the Combined Magnetic Stimulation and Opto-Chemical Sensing of Neural Tissue", Proc. IEEE International Conference on Cellular Neural Networks and Applications (CNNA- San Francisco, USA), 2010, invited paper.

DM Garner, H Bai, P Georgiou, TG Constandinou, S Reed, LM Shepherd, W Wong Jr., KT Lim, C Toumazou, "A multichannel DNA SOC for rapid point-of-care gene detection", Proc. IEEE International Solid-State Circuits Conference (ISSCC- San Francisco, USA), 2010.

A Eftekhar, TG Constandinou, D Abbruzzese, V Woods, IF Triantis, EM Drakakis, C Toumazou, "A Programmable Neural Interface for Investigating Arbitrary Stimulation Strategies", International Functional Electrical Stimulation Society Conference (IFESS- Seoul, Korea), 2009.

TG Constandinou, J Georgiou, C Toumazou, "A Neural Implant ASIC for the Restoration of Balance in Individuals with Vestibular Dysfunction", IEEE International Symposium on Circuits and Systems (ISCAS- Taipei, Taiwan), pp. 641-644, 2009.

L Yan, P Georgiou, TG Constandinou, D Garner, C Toumazou, "An Auto-Offset-Removal circuit for chemical sensing based on the PG-ISFET", IEEE International Symposium on Circuits and Systems (ISCAS- Taipei, Taiwan), pp. 1165-1168, 2009.

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

-University of New Haven, March 3rd 2010 "Integrated biomedical instrumentation: miniature patch-clamp and brain imaging devices", host: Prof. Ismail Orabi.

-University of Washington at St Louis, Feb 19th 2010, "Biomedical instruments for patch-clamp recordings and voltage-sensitive dye imaging", host: Viktor Gruev.

-Yale Science Saturdays, October 10th 2009, "What Makes Your Gameboy Work: How Electronics are Evolving", host: Ainissa Ramirez

-Yale - Aging Research Seminar: "Synthetic vision system for assisted living" 9/2/2009, host: Lisa Barry.

-Telluride Neuromorphic Engineering Workshop, July 3rd 2009: "Optical Neural Recording: in-vivo fast functional brain imaging with fluorescent dyes".

-Yale Biomedical Engineering Seminar, April 16th 2009: "Novel instrumentation for optical brain imaging and high-throughput patch-clamp", host: Erin Lavik.

-DARPA NeoVision 2, "Efficient feedforward categorization of objects and human postures with address-event image sensors", April 8th 2009.

Professional Activities and Service

-IEEE ISCAS Special Sessions Organizer

-Reviewer for: IEEE International n 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

Board Memberships:

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

Awards, Honors, Patents:

Nominated for the PECASE Award in 2009-2010 by ONR program manager Thomas McKenna.

Publications

Peer Reviewed Papers:

A Low-power High-speed Ultra-Wideband Pulse Radio Transmission System, Wei Tang, E. Culurciello, IEEE Transactions on Biomedical Circuits and Systems, Special Issue on ISCAS 2008, Oct. 2009, pp 286-292

A 1-mW CMOS Temporal-Difference AER Sensor for Wireless Sensor Networks, D. Kim, Z.M. Fu, E. Culurciello, IEEE Transactions on Electron Devices, Special issue on solid-state image sensors, invited paper, November 2009, pp 2586-2593.

An Integrated Patch-Clamp Potentiostat with Electrode Compensation, P. Weerakoon, K. Klemic, F.J. Sigworth, E. Culurciello, IEEE Transactions on Biomedical Circuits and Systems TBCAS, invited paper, April 2009, Vol. 3, Issue 2, pp. 117-125.

Ultra-low Current Measurements with Silicon-on-sapphire Integrator Circuits, E. Culurciello, H. Montanaro, D. Kim, IEEE Electron Device Letters, Vol. 30, Issue 3, March 2009, pp 258-260.

Peer Reviewed Conference Papers:

An Integrated Patch-Clamp System with Dual Input, P. Weerakoon, F. Sigworth, P. Kindlmann, J. Santos-Sacchi, Y. Yang, E. Culurciello, IEEE International Symposium on Circuits and Systems, 2010. ISCAS 2010, Paris, France, pp.- .

Performance Comparison of Low Current Measurement Systems for Biomedical Applications, D. Kim, W. Tang, B. Goldstein, P. Weerakoon, E. Culurciello, IEEE International Symposium on Circuits and Systems, 2010. ISCAS 2010, Paris, France, pp.- .

Hardware Accelerated Convolutional Neural Networks for Synthetic Vision Systems, C. Farabet, B. Martini, P. Akselrod, S. Talay, Y. LeCun and E. Culurciello, IEEE International Symposium on Circuits and Systems, 2010. ISCAS 2010, Paris, France, pp. - .

A Compact-pixel Tri-mode Vision Sensor, Dongsoo Kim, Eugenio Culurciello, IEEE International Symposium on Circuits and Systems, 2010. ISCAS 2010, Paris, France, pp. - .

4 Channel Asynchronous Bio-Potential Recording System, Wei Tang, Chenxi Huang, Dongsoo Kim, Berin Martini, Eugenio Culurciello, IEEE International Symposium on Circuits and Systems, 2010. ISCAS 2010, Paris, France, pp.- .

A 64x64 Pixels UWB Wireless Temporal-Difference Digital Image Sensor, Shoushun Chen, Wei Tang, Eugenio Culurciello, IEEE International Symposium on Circuits and Systems, 2010. ISCAS 2010, Paris, France, pp.- .

A Biologically Inspired System for Human Posture Recognition, Shoushun Chen, Polina Akselrod and Eugenio Culurciello, IEEE Biomedical Circuits and Systems Conference, November 2009, pp. - .

A Bio-Inspired Event-Based Size and Position Invariant Human Posture Recognition Algorithm, S.S. Chen, E. Culurciello, IEEE International Symposium on Circuits and Systems, 2009. ISCAS 2009, 24-27 May 2009, Taipei, Taiwan, pp. 775 - 778.

Live demonstration: A bio-inspired event-based size and position invariant human posture recognition algorithm, S.S. Chen, B. Martini, E. Culurciello, IEEE International Symposium on Circuits and Systems, 2009. ISCAS 2009, May 24 2009 pp. 779 - 779.

A low-power high-speed ultra wideband pulse radio system, W. Tang, E. Culurciello, IEEE International Symposium on Circuits and Systems, 2009. ISCAS 2009, May 24 2009, pp. 1916 - 1916.

A Pulse-Based Amplifier and Data Converter for Bio-Potentials, W. Tang, E. Culurciello, IEEE International Symposium on Circuits and Systems, 2009. ISCAS 2009, 24-27 May 2009, Taipei, Taiwan, pp. 337 - 340

High-Speed Fluorescence Imaging System for Freely Moving Animals, J.H. Park, V. Pieribone, J.V. Verhagen, C. von Hehn, E. Culurciello, IEEE International Symposium on Circuits and Systems, 2009. ISCAS 2009, 24-27 May 2009, Taipei, Taiwan, pp. 2429 - 2432.

Miniature Voltage Sensitive Dye Imaging System for In Vivo Experiments, Joon Hyuk Park, Vincent Pieribone, Dongsoo Kim, Justus Valentijn Verhagen, Shree Hari Gautam, Eugenio Culurciello, IEEE-NIH LIfe Science Systems and Applications Workshop LISSA 2009, NIH April9-10th 2009, pp. 70 - 73.

Book Chapters

Books

Tobi Delbruck (2009)

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

10.02.09 11:00:00-10.02.09 12:00:00   Univ. of California Irvine (UCI)   Fast vision with spikes   Invited Speaker

22.05.09 10:00:00-22.05.09 11:00:00   Nanyang Technical University (NTU)   Fast and cheap digital vision and audition with spike-based silicon retinas and cochleas   Invited Speaker

29.05.09 14:00:00-29.05.09 15:00:00   Institute of Microelectronics   Fast and cheap digital vision and audition with spike-based silicon retinas and cochleas   Invited Speaker

02.07.09 16:00:00-02.07.09 17:00:00   2009 Telluride Neuromorphic Cognition Engineering Workshop   Tutorial on AER retina and cochlea sensors and how we'll use them at the workshop   Invited Speaker

23.09.09 16:00:00-23.09.09 17:00:00   Department of Physics, Main weekly colloquium, ETH Zurich   Silicon retina-tetina-tetina   Invited Speaker

Professional Activities and Service

Co-organizer (with Timmer Horiuchi and Ralph Etienne-Cummings), Telluride Neuromorphic Cognition Engineering Workshop
Co-organizer (with Philipp Hafliger), ISCAS Live Demonstrations of Circuits and Systems Track
Reviewer for ISCAS conf, for various journals.

Board Memberships:

2007 – 2010 IEEE Trans. on BioMedical Circuits and Systems Associate Editor

Awards, Honors, Patents:

Appointed Titular Professor of Physics, ETH Zurich, Dec 2009.

Publications

Journal

- **CAVIAR: A 45k-Neuron, 5M-Synapse, 12G-connects/sec AER Hardware Sensory-Processing-Learning-Actuating System for High Speed Visual Object Recognition and Tracking**, (2009), R. Serrano-Gotarredona; M. Oster, P. Lichtsteiner, A. Linares-Barranco, R. Paz-Vicente, F. Gomez-Rodriguez, L. Camuñas-Mesa, R. Berner, M Rivas, T. Delbruck, S.C. Liu, R.Douglas, P. Hafliger, G.J. Moreno, A. Civit, T. Serrano-Gotarredona, A. Acosta-Jimenez, B. Linares-Barranco, *IEEE Transactions on Neural Networks,* vol 20(9), pp. 1417-1438.
- **Getting to know your neighbors: Unsupervised learning of topography from real-world, event-based input**, (2008), M. Boerlin, T. Delbruck, K. Eng, *Neural Computation,* Jan 2009, Vol. 21, No. 1: 216–238.

Conference

Live demonstration: Computing spike-based convolutions on GPUs, J.M. Nageswaran, N. Dutt, Y. Wang, T. Delbruck, in Live Demonstrations of Circuits and Systems at IEEE International Symposium on Circuits and Systems 2009 (ISCAS 2009), pp. 1917-1920.

An Embedded AER Dynamic Vision Sensor for Low-Latency Pole Balancing, J. Conradt, R. Berner, M. Cook, T. Delbruck, in 5th IEEE Workshop on Embedded Computer Vision, with ICCV 2009, Kyoto, pp. 1-6.

Live demonstration: A pencil balancing robot that uses only spike-based visual input, J. Conradt, P. Lichtsteiner, R. Berner, T. Delbruck, RJ. Douglas, M. Cook, in Live Demonstrations of Circuits and Systems at IEEE International Symposium on Circuits and Systems 2009 (ISCAS 2009), pp. 781-785.

Implementation of a time-warping AER mapper, A. Linares-Barranco, F.Gomez-Rodriguez, G. Jimenez, T. Delbruck, R.Berner, S-C Liu, Proceedings of IEEE International Symposium on Circuits and Systems, May, 2009, pp. 2886-2889.

Piotr Dudek

Professional Activities and Service

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
Scientific/Technical/Review Committee member: CNNA, ISCAS, ICST, WCCI, IJCNN

Workshops/Conferences/Panels/Invited Talks:

Demos and Exhibitions Chair and member of the Organising Committee of IEEE Workshop on Cellular Nanoscale Networks and Applications, CNNA 2010, Berkeley
Session Chair: International Symposium on Circuits and Systems ISCAS 2009,
Session Chair: European Conference on Circuit Theory and Design ECCTD 2009
Invited Speaker: Telluride Worskshop on Neuromorphic Engineering, Telluride, Cobrado, July 2009
Invited Speaker: UK Design Forum, Manchester, UK, March 2010

Awards

Best Student Paper Award: M.Geese and P.Dudek, "Autonomous Long Distance Transfer on SIMD Cellular Processor Arrays", IEEE Workshop on Cellular Nanoscale Networks and Applications, CNNA 2010, Berkeley, pp. 365-370, February 2010

Publications

Journal Publications:

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, in press

A.Lopich and P.Dudek, Hardware Implementation of Skeletonization Algorithm for Parallel Asynchronous Image Processing Journal of Signal Processing Systems, Springer, Volume 56, Number 1, pp. 91-103, July 2009

D.R.W.Barr and P.Dudek, "APRON: A Cellular Processor Array Simulation and Hardware Design Tool", EURASIP Journal on Advances in Signal Processing, Article ID 751687, 9 pages, 2009

Peer Reviewed Conference Papers:

A.Lopich and P.Dudek, "An 80x80 general-purpose digital vision chip in 0.18um CMOS technology", IEEE Symposium on Circuits and Systems, ISCAS 2010 (accepted)

M.Geese and P.Dudek, "Autonomous Long Distance Transfer on SIMD Cellular Processor Arrays", IEEE Workshop on Cellular Nanoscale Networks and Applications, CNNA 2010, Berkeley, pp. 365-370, February 2010

S.Mandal, B.Shi and P.Dudek, "Binocular Disparity Calculation on a Massively-Parallel Analog Vision Processor", IEEE Workshop on Cellular Nanoscale Networks and Applications, CNNA 2010, Berkeley, pp. 285-289, February 2010

S.Razmjooei and P.Dudek, "Approximating Euclidean Distance Transform with Simple Operations in Cellular Processor Arrays", IEEE Workshop on Cellular Nanoscale Networks and Applications, CNNA 2010, Berkeley pp. 181-185, February 2010

Y.Wang, T.Wu, G.Orchard, P.Dudek, M.Rucci and B.Shi, "Hebbian Learning of Visually Directed Reaching by a Robot Arm", IEEE Biomedical Circuits and Systems Conference, BioCAS 2009, pp.205-208, 2009

J.H.B.Wijekoon and P.Dudek, "A CMOS circuit implementation of a spiking neuron with bursting and adaptation on a biological timescale", IEEE Biomedical Circuits and Systems Conference, BioCAS 2009, pp.193-196, 2009

P.Dudek, A.Lopich and V.Gruev, "A pixel-parallel cellular processor array in a stacked three-layer 3D silicon-on-insulator technology", European Conference on Circuit Theory and Design, ECCTD 2009, pp.193-197, August 2009

Ralph Etienne-Cummings (2009 – 2010 Summary)

Professional Activities and Service

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

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 – 2009

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

Instructor, NSF Sponsored Course on Telluride Neuromorphic Engineering, 1996- Present

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

Organized/Lead various tutorials, workshops and panels at international conferences, *ISCAS, NIPS, ISSCC, BioCAS*, 1997 - Present

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

Developed New Course, 520.391/491, 520.738, 520.427, 520.661/662, 520.771/772, *JHU*, 1998 – Present

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

Appointed Chair of WSE Tenure and Promotion Committee, JHU WSE, October 2009

Appointed Chair of the ECE Faculty Search Committee, ECE Department, December 2009

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

Appointed to Science of Learning Center Committee of Visitors, *National Science Foundation*, March 2009

Appointed Assoc. Director for Education and Outreach, *ERC on CISST at Johns Hopkins University,* 2004 – 2009

Appointed Organizing Committee of the NSF Telluride Neuromorphic Engineering Workshop, 2003 – Present

Appointed Senior Associated Editor, *IEEE Sensors Journal,* July 2008 – Present

Appointed Associated Editor, IEEE Trans. Biomedical Circuits and Systems, 2006 – Present

Chair of Promotion and Tenure Committee: Served on one P & T committee at JHU, 2009

Promotion and Tenure Referee: Associate Professor for 3 candidates, 2009

Promotion and Tenure Referee: Professor for 2 candidates, 2009

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

Member of Program Committee: ISCAS, BioCAS

Honors

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

Patents:

F. Tenore, F. Folowosele, J. Tapson and R. Etienne-Cummings, "A Neuromorphic Cross-Correlation Engine" Utility Patent Filed, May 2009.

Workshops/Conferences/Panels/Invited Talks:

Session Chairman: International Symposium on Circuits and Systems, 2001-2009

Invited Speaker: Hong Kong University of Science and Technology, Hong Kong, P.R. China, May 2009.

Invited Speaker: JHU Applied Physics Laboratory, Laurel, MD, August 2009.

Invited Speaker: Center for Research in Minority Institutions, U. Hawaii- Manoa, HI, October 2009.

Invited Speaker: Bodian Lecture, Mind-Brain Institute, JHU, Baltimore, MD, November 2009.

Invited Speaker: Morgan State University, Baltimore, MD, November 2009.

Review Committee of Visitors: NSF SLC Programs, Arlington, VA, February, 2009.

Review Site Visitor: NSF-ERC QOLT, Carniegie Mellon U., Pittsburgh, PA, March, 2009.

Review of Faculty Member: Tufts University, Medford, MA, November, 2009.

Tutorial Presenter: IEEE BioCAS Conference, Beijing, P.R. China, November 2009.

Journal Publications:

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*, July 2009.

K. Murari, R. Etienne-Cummings, G. Cauwenberghs, and N. Thakor, "Which Photodiode To Use: A Comparison of CMOS-Compatible Structures," *IEEE Sensors Journal,* Vol. 9, No. 7, pp. 752-761, 2009.

C. Obasi, A. Agwu, W. Akinpelu, R. Hammons, C. Clark, R. Etienne-Cummings, P. Hill, R. Rothman, S. Babalola, T. Ross, K. Carroll and B. Asiyanbola, "Contamination of Equipment in Emergency Settings: An Exploratory Study with a Targeted Automated Intervention," *Annals of Surgical Innovation and Research*, Vol. 3, No. 8, doi:10.1186/1750-1164-3-8, July 2009.

Y. M. Chi, R. Etienne-Cummings and G. Cauwenberghs, "Focal-Plane Change Triggered Video Compression for Low-Power Vision Sensor Systems," *Public Library of Science One*, Vol. 4, No. 7: e6384. doi:10.1371/journal.pone.0006384, 2009.

J. Tapson, C. Jin, A. van Schaik and R. Etienne-Cummings, "A First-Order Non-Homogeneous Markov Model for Integrate-and-Fire Neurons Stimulated by Small Phase-Continuous Signals," *Neural Computation*, Vol. 21, No. 6, pp. 1554-1588, 2009.

F. Tenore, A. Ramos Murguialday, A. Fahmy, R. Etienne-Cummings, and N. V. Thakor, "Towards Real-Time Control of Individuated Finger Movements using Surface Myoelectric Signals," *IEEE T. Biomedical Engineering*, Vol. 56, No. 5, pp. 1427, 2009.

C. Clark, C. White and R. Etienne-Cummings, "Design and Optimization of Tissue Specific Ultrasonic Systems," submitted to *IEEE Sensors Journal*, Fall 2009.

G. Orchard and R. Etienne-Cummings, "Discriminating Multiple Nearby Targets Using a Single Ping Ultrasonic Mapping," submitted to *IEEE T. Circuits and Systems I*, Fall 2009.

A. Russell, G. Orchard, Y. Dong, S. Mihalas, E. Niebur, J. Tapson, R. Etienne-Cummings, "Optimization methods for spiking neurons and networks", submitted to *IEEE Transactions on Neural Networks*, Fall 2009.

K. Murari, R. Etienne-Cummings, G. Cauwenberghs and N. Thakor, "A CMOS In-Pixel CTIA High Sensitivity Fluorescence Imager," submitted to *IEEE J. Solid-State Circuits*, Winter 2010.

Conference Publications:

K. Murari, E. Greenwald, R. Etienne-Cummings, G. Cauwenberghs and N. Thakor, "Design and Characterization of a Miniaturized Epi-Illuminated Microscope," IEEE EMBS, Minneapolis, MN, 2009

A. F. Russell, R. S. Armiger, R. J. Vogelstein, S. J. Bensmaia and R. Etienne-Cummings, "Real-Time Implementation Of A Biofidelic SA1 Model For Tactile Feedback," IEEE EMBS, pp. 185-188, Minneapolis, MN, 2009.

H. Schwerdt, J. Tapson and R. Etienne-Cummings, "A Color Detecting Glove with Haptics Feedback for the Visually Impaired," *Proc. CISS'09*, Baltimore, MD, March 2009.

G. Orchard, J. Molin and R. Etienne-Cummings, "Simulation of a Single-Ping Ultrasonic Bearing and Range Measurement System Using Spatio-Temporal Filters," *Proc. CISS'09*, Baltimore, MD, March 2009.

S. Mitra, R. Zele and R. Etienne-Cummings, "Low-Voltage, High CMRR OTA For Electrophysiological Measurements," *ISCAS 2009*, Tiepei, Taiwan, May 2009.

F. Folowosele, A. Harrison, A. Cassidy, A. Andreou, R. Etienne-Cummings, S. Mihalas, E. Niebur, T. Hamilton, "A Switched Capacitor Implementation of the Generalized Linear Integrate-and-Fire Neuron," *ISCAS 2009*, Tiepei, Taiwan, May 2009.

Alexander Fish (2009-2010)

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

"Digital Subthreshold Logic Design in the Era NaNoscale CMOS", Invited for Chip Design Conference, Tel Aviv, November 2009. "Digital Low voltage Logic in the Era NaNoscale CMOS", invited lecture, Tel Aviv University, March 2010.

Professional Activities and Service

Member of the IEEE CAS Neural Networks, Biocas and Sensors Technical Committees (2007– present).

Board Memberships:

IEEE Sensors Conference, Christchurch, New Zealand, Special Session Co-organizer "Design Methodologies for Low Power Sensory and Memory Arrays", (October 2009)

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:

A. Spivak, a. Belenky, A. Fish, O. Yadid-Pecht, "Wide Dynamic Range CMOS Image Sensors– Comparative Performance Analysis", IEEE Transactions on Electron Devices, 2009, Vol. 56, Issue 11, pp. 2445-2461.

A. Belenky, A. Fish, A. Spivak, O. Yadid-Pecht, "A snapshot CMOS Image Sensor with Extended Dynamic Range", IEEE Sensor Journal, vol. 9, issue 2, pp.103-111, Feb 2009.

X. Li, Y. Shoshan, A. Fish, G. A. Jullien, O. Yadid-Pecht, "Hardware Implementations of Video Watermarking", International Journal on Information Technologies and Knowledge, June 2009, Vol. 5, pp. 9-16.

Peer Reviewed Conference Papers:

A. Teman, O. Yadid-Pecht, A. Fish, "An Improved AB^2C Scheme for Leakage Power Reduction in Image Sensors with On-chip Memory", IEEE Sensors Conference, Christchurch, New Zealand, October 2009.

S. Fisher, A. Teman, D. Vaysman, A. Gertsman, O. Yadid-Pecht, A. Fish, "Ultra-Low Power Subthreshold Flip Flop Design", IEEE International Symposium on Circuits and Systems (ISCAS'09) Taipei, Taiwan, May 2009, pp. 1573-1576.

Book Chapters

Books

Maysam Ghovanloo (2009-2010)

IEEE Services: Workshops/Conferences/Panels/Invited Talks/Review committees

Organizers: conferences, workshops, ...

Technical Review Committee, IEEE Intl. Symp. on Circuits and Systems (ISCAS'10), Paris, France, June 2010.

Track Co-Chair, IEEE Engineering in Medicine and Biology Conference, Neural Microsystems, Minneapolis, MN, September 2009 (with Prof. Patrick Wolf).

Track Co-Chair, IEEE Engineering in Medicine and Biology Conference, Wireless Sensors and Telemetry, Minneapolis, MN, September 2009 (with Prof. Sameer Sonkusale).

Technical Review Committee, IEEE Intl. Symp. on Circuits and Systems (ISCAS'09), Taipei, Taiwan, May 2009.

Technical Program Committee, IEEE Biomedical Circuits and Systems conference, Baltimore, MD, November 2008.

Invited talks: plenary sessions, keynotes, invited lectures, ...

Invited talk on "Novel Technologies for Improving the Quality of Life for People with Severe Disabilities," *ARC Broward Achievement and Rehabilitation Centers*, Ft. Lauderdale, FL, Nov. 2009.

Invited talk on "Novel Technologies for Improving the Quality of Life for People with Severe Disabilities," *The Academy of Persian Physicians*, Palm Desert, CA, Oct. 2009.

Invited talk on "Wireless Neural Interfacing Technology" School of Aerospace, *Tsinghua University*, Beijing, China, July 2009.

Editorial services:

Associate Editor, Transactions on Circuits and Systems II, Dec. 2007 ~ Present

Member of Subcommittee on Imagers, MEMS, Medical and Displays (IMMD), *International Solid States Circuits Conference* (Feb. 2009 - Present).

Publications

Journal manuscripts:

U. Jow and **M. Ghovanloo**, "Optimization of data coils in a multiband wireless link for neuroprosthetic implantable devices," Accepted for publication in *IEEE Trans. on Biomed. Circuits and Systems*, Apr. 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.

U. Jow and **M. Ghovanloo**, "Modeling and optimization of printed spiral coils in air, saline, and muscle tissue environments," *IEEE Trans. on Biomed. Circuits and Systems,* vol. 3, no. 5, pp. 339-347, Oct. 2009.

M. Yin and **M. Ghovanloo**, "Using pulse width modulation for wireless transmission of neural signals in multichannel neural recording systems," *IEEE Trans. on Neural Sys. Rehab. Eng.,* vol. 17, no. 4, pp. 354-363, Aug. 2009.

G. Bawa and **M. Ghovanloo**, "Analysis, design and implementation of a high efficiency full-wave rectifier in standard CMOS technology," *Analog Integrated Circuits and Signal Processing,* vol. 60, pp. 71-81, Aug. 2009.

X. Huo and **M. Ghovanloo**, "Using unconstrained tongue motion as an alternative control surface for wheeled mobility," *IEEE Trans. on Biomed. Eng,* vol. 56, no. 6, pp. 1719-1726, June 2009.

Conference proceedings:

G. Bawa, A. Huang, and **M. Ghovanloo**, "An efficient 13.56 MHz active back-telemetry rectifier in standard CMOS technology," To be presented at *IEEE Intl. Symp. on Circuits and Systems*, May 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.

M. Kiani and **M. Ghovanloo**, "A closed loop wireless power transmission system using a commercial RFID transceiver for biomedical applications," Proc. *IEEE 31st Eng. in Med. and Biol. Conf.*, pp. 3841-3844, Sep. 2009.

C. Cheng, X. Huo, and **M. Ghovanloo**, "Towards a magnetic localization system for 3-D tracking of tongue movements in speech-language therapy," Proc. *IEEE 31st Eng. in Med. and Biol. Conf.*, pp. 563-566, Sep. 2009.

X. Huo, C. Cheng, and **M. Ghovanloo**, "Evaluation of the tongue drive system by individuals with high-level spinal cord injury," Proc. *IEEE 31st Eng. in Med. and Biol. Conf.*, pp. 555-558, Sep. 2009.

U. Jow and **M. Ghovanloo**, "Modeling and optimization of printed spiral coils in air and muscle tissue environments," Proc. *IEEE 31st Eng. in Med. and Biol. Conf.*, pp. 6387-6390, Sep. 2009.

M. Yin, S.B. Lee, and **M. Ghovanloo**, "*In vivo* testing of a low noise 32-channel wireless neural recording system," Proc. *IEEE 31st Eng. in Med. and Biol. Conf.*, pp. 1608-1611, Sep. 2009.

M. Ghovanloo, "Novel technologies for wireless interfacing with the central nervous system," *International Conference for Bioeconomy*, Beijing, China, June 2009.

X. Huo, J. Bruce, and **M. Ghovanloo**, "Preliminary evaluation of a tongue operated assistive technology by individuals with high-level SCI for computer access and wheeled mobility," Proc. *RESNA Conference*, New Orleans, LA, June 2009.

In the Media:

"Tongue Power: Clinical Trial Shows Quadriplegic Individuals Can Operate Powered Wheelchairs and Computers with Tongue Drive System," Georgia Tech Research News and Publications News Release: http://gtresearchnews.gatech.edu/newsrelease/tonguedrive2.htm, July 2009.

"Besides kissing and tasting, tongue can drive and help see," CNN http://www.cnn.com/2009/HEALTH/08/27/tongue.wonders/index.html, Sep. 2009.

"Tongue Driver," Science Nation (the NSF online Magazine) http://www.nsf.gov/news/special_reports/science_nation/tonguedriver.jsp, Oct. 2009.

"Wheelchair mobility at the tip of the tongue," CNN Health Minute http://www.cnn.com/2010/HEALTH/01/25/hm.wheelchair.tongue/index.html, Jan. 2010.

Viktor Gruev (2009-2010)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Professional Activities and Service

Member of the IEEE CAS Analog Signal Processing, Biocas and Sensors Technical Committees (2004– present).
Organized special session on Circuits and Systems activity in Life science area at IEEE/NIH LiSSA 2009.
Technical Program Committee for IEEE International Mixed-Signals, Sensors, and Systems Test Workshop.

Board Memberships:

Awards, Honors, Patents:

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, 2009

Publications

Peer Reviewed Papers:

Viktor Gruev, Zheng Yang, Jan Van der Spiegel and Ralph Etienne-Cummings, "Current Mode Image Sensor with Two Transistors per Pixel" IEEE Trans. On Circuits and Systems, 2010.

Viktor Gruev, Zheng Yang and Jan Van der Spiegel "Low Power Linear Current Mode Imager with 1.5 Transistors per Pixel," IEE Electronics Letters, 2009.

Peer Reviewed Conference Papers:

Viktor Gruev and Rob Perkins " A 1 MPixel CCD Image Sensor with Aluminum Nanowire Polarization Filter," IEEE ISCAS, 2010.

Raphael Njuguna and Viktor Gruev, "Linear Current Mode Image Sensor With Focal Plane Spatial Image Processing," IEEE ISCAS, 2010.

Timothy York and Viktor Gruev, " Real-time Polarizaiton Imaging at 1 Megapixel Resolution," Computer Vision and Pattern Recognition, 2010.

Piotr Dudek, Alexey Lopich and Viktor Gruev "Vision Sensor with a SIMD Processor Array in a Vertically Stacked 3D Integrated Circuit Technology" W5 3D Integration Workshop, Dreseden, Germany 2010.

Viktor Gruev, Jan Van der Spiegel and Nader Engheta, "Integrated Polarization Image Sensor for Cell Detection," International Image Sensor Workshop, Bergen, Norway, June 2009.

Viktor Gruev, Jan Van der Spiegel and Nader Engheta, "Nano-wire Dual Layer Polarization Filter," Proc. IEEE ISCAS, Taipei, Taiwan, May 2009.

Viktor Gruev, Jan Van der Spiegel and Nader Engheta, "Advances in Integrated Polarization Imaging Sensors," IEEE/NIH LiSSA Workshop, Bethesda, USA, March 2009.

Book Chapters

Books

Philipp Hafliger (2009-2010)

IEEE Services

invited talks:

- Microelectronic Implants, at Open Day of the University of Oslo

- Professional Activities and Services

- Vice chair of the IEEE CASS BioCAS TC
- Guest associate Editor for IEEE transactions on BioCAS
- Track co-chair ISCAS 2009 and 2010 Live demonstrations of circuits and systems track

- Publications

Peer reviewed journals

"CAVIAR: A 45k Neuron, 5M Synapse, 12G Connects/s AER Hardware Sensory-Processing-Learning-Actuating System for High-Speed Visual Object Recognition and Tracking R. Serrano-Gotarredona," M. Oster, P. Lichtsteiner, A. Linares-Barranco, R. Paz-Vicente, F. Gomez-Rodriguez, L. Camunas-Mesa, R. Berner, M. Rivas-Perez, T. Delbruck, S. C. Liu, R. Douglas, P. Hafliger, G. Jimenez-Moreno, A. Civit Ballcels, T. Serrano-Gotarredona, A. J. Acosta-Jimenez, and B. Linares-Barranco, IEEE Transactions on Neural Networks, 2009, vol. 20 (9), p 1417-1438

"Towards an injectable continuous osmotic glucose sensor," Erik Johannessen, Olga Krushinitskaya, Andrey Sokolov, Philipp Häfliger, Arno Hoogerwerf, Christian Hinderling, Kari Kautio, Jaakko Lenkkeri, Esko Strommer, Vasily Kondratyev, Tor Inge Tønnessen, Tom Eirik Mollnes, Henrik Jakobsen, Even Zimmer, Bengt Akselsen, Journal of Diabetes Science and Technology, accepted for publication July 2010

Peer reviewed conferences

"Live demonstration: inductive power and telemetry for micro-implant P. Häfliger, Proceedings of the IEEE ISCAS 2010 , accepted for publication

"Live demonstration of an asynchronous integrate-and-fire pixel-event vision sensor," J. A. M. Olsson and P. Häfliger, Proceedings of the IEEE ISCAS 2009, P. 774

"Novel Osmotic Sensor for a Continuous Implantable Blood-Sugar Reader," Olga Krushinitskaya, Philipp Häfliger, Tormod Vinsand, Tor Inge Tønnessen, Henrik Jakobsen and Erik Johannessen Proceedings of pHealth 2009

Tara Julia Hamilton (2009-2010)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

"Spiking Silicon Neurons: The Potential for Action", invited at the Telluride Neuromorphic Cognition Workshop, Telluride Colorado July 2009.

Professional Activities and Service

Member of the IEEE CAS Sensors Technical Committees (2009 – present).

Board Memberships:

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:

Peer Reviewed Conference Papers:

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

T.J. Hamilton, N.M. Nelson, D. Sander, P. Abshire "A Cell Impedance Sensor Based on a Silicon Cochlea", *IEEE Biomedical Circuits and Systems Conference (BioCAS), Beijing, China 2009*

F. Folowosele, R. Etienne-Cummings, T.J. Hamilton "A CMOS Switched Capacitor Implementation of the Mihalas-Niebur Neuron", *IEEE Biomedical Circuits and Systems Conference (BioCAS), Beijing, China 2009*

B. Thanigaivelan, A. Postula, T.J. Hamilton "A modified MOSFET small-signal model based on Affine Arithmetic concepts", IEEE Asia Pacific Conference on Postgraduate Research in Microelectronics and Electronics (PRIME ASIA), Shanghai, China 2009

Book Chapters

A. van Schaik, T.J. Hamilton, and C. Jin, "Silicon Models of the Auditory Pathway," in Computational Models of the Auditory System, Springer Handbook of Auditory Research, Vol. 35, edited by Meddis, R.; Lopez-Poveda, E.A.; Fay, R.R.; Popper, A.N., 2010, Ch 10. In press, accepted August 2009, to appear in April 2010.

Books

Giacomo Indiveri (2009-2010)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

"Neural computation and synaptic plasticity using neuromorphic VLSI", International Workshop on Neuromorphic Systems & Neural Prostheses, Taipei, Taiwan (May 2009) [Invited Speaker]

"Neural computation and learning using neuromorphic VLSI circuits", IBT, Zurich, Switzerland (Oct 2009) [Invited Speaker]

"Neuromorphic circuits for modeling neural computation in the cortex", Basel Computational Biology Seminar Series, Basel, Switzerland (Nov 2009) [Invited Speaker]

Professional Activities and Service

Tutorial presenter at the ICANN 2009 conference: Analog VLSI circuits for spiking neural networks

Tutorial presenter at the ISCAS 2010 conference: Analog/digital and hybrid bio-silicon circuits for hardware neurons, synapses, and spiking neural networks

Distinguished Lecturer in 2009-2010

Chief editor of the newly established "Frontiers in Neuromorphic Engineering" journal.

Associate editor of the "IEEE Transactions in Neural Networks".

Associate editor of "Cognitive Computation" (Springer).

Associate editor of "Advances in Artificial Neural Systems" (Hindawi).
Reviewer of
    IEEE Transactions Circuits and Systems
    IEEE Transactions Biomedical Circuits and Systems
    Frontiers in neuroengineering
    American Journal of Physics
    Neural Networks

Board Memberships:

Board of directors of the Telluride Neuromorphic Cognition Engineering Workshop, 2007 - present
Organizer of the 2010 Capo Caccia Cognitive Neuromorphic Engineering Workshop (http://www2.ini.uzh.ch/db2/node/12596)

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:

Bartolozzi, C. and Indiveri, G.. Selective Attention in Multi-Chip Address-Event Systems , Sensors, 9:(7) 5076-5098, Jul, 2009
Bartolozzi, C. and Indiveri, G.. Global scaling of synaptic efficacy: Homeostasis in silicon synapses , Neurocomputing (72) 726-731, Jan, 2009
Indiveri, G. and Chicca, E. and Douglas, R.. Artificial cognitive systems: From VLSI networks of spiking neurons to neuromorphic cognition , Cognitive Computation, 1:(2) 119-127, Mar, 2009

Peer Reviewed Conference Papers:

Livi, P. and Indiveri, G.. A current-mode conductance-based silicon neuron for Address-Event neuromorphic systems , IEEE International Symposium on Circuits and Systems, ISCAS 2009 2898-2901, May, 2009
Mitra, S. and Fusi, S. and Indiveri, G.. Real-Time Classification of Complex Patterns Using Spike-Based Learning in Neuromorphic VLSI , IEEE Transactions on Biomedical Circuits and Systems, 3:(1) 32-42, 2009
Orchard, G. and Bartolozzi, C. and Indiveri, G.. Applying neuromorphic vision sensors to planetary landing tasks , Biomedical Circuits and Systems Conference, 2009. BioCAS 2009. IEEE 201 - 204 , Nov, 2009

Bernabé Linares-Barranco (2009-2010)

IEEE Services

Associate Editor IEEE TNN (from January 1998 until December 2009)
IEEE CAS SSTC Chair since May 2009

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 "Activity-Driven, Event Coding Vision Sensors", (ISCAS 2010)
IEEE International Symposium on Circuits and Systems, Special Session Co-organizer "Adaptive Convolutional Neural Networks, Theory, Hardware & Applications", (ISCAS 2010)

Awards, Honors, Patents:

IEEE Fellow since January 2010

Publications

Peer Reviewed Papers:

G. Vicente-Sánchez, J. Velarde-Ramírez, T. Serrano-Gotarredona, and B. Linares-Barranco, "A Weak-to-Strong Mismatch Model for Analog Circuit Design," Int. Journal of Analog Integrated Circuits and Signal Processing, vol. 59, pp. 325-340, 2009.

Rafael Serrano-Gotarredona, M. Oster, P. Lichteiner, A. Linares-Barranco, R. Paz-Vicente, F. Gomez-Rodriguez, L. Camuñas-Mesa, R. Berner, M. Rivas, T. Delbruck, C. S. Liu, P. Halfinger, G. Jimenez-Moreno, A. Civit, T. Serrano-Gotarredona, A. Acosta-Jiménez, and B. Linares-Barranco, "CAVIAR: A 45K-neuron 5M-synapse 12G-connections/second AER hardware sensory-processing-learning-actuating system for high-speed visual object recognition and tracking," IEEE Trans. on Neural Networks, vol. 20, no. 9, pp. 1417-1438, September 2009.

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, in Press.

Peer Reviewed Conference Papers:

J. A. Leñero-Bardallo, T. Serrano-Gotarredona, and B. Linares-Barranco, "A Mismatch Calibrated Bipolar Spatial-Contrast AER Retina with Adjustable Contrast Threshold," IEEE International Symposium on Circuits and Systems, ISCAS 2009, Taipei, May, 2009.

C. Zamarreño-Ramos, T. Serrano-Gotarredona, and B. Linares-Barranco, "OTA-C Oscillator with Low Frequency Variations for On-Chip Clock Generation in Serial LVDS-AER Links," IEEE International Symposium on Circuits and Systems, ISCAS 2009, Taipei, May, 2009.

B. Linares-Barranco, and T. Serrano-Gotarredona, "Exploiting Memristance in Adaptive Asynchronous Spiking Neuromorphic Nanotechnology Systems," IEEE NANO 2009, Genoa, Italy, July, 2009.

T. Serrano-Gotarredona, B. Linares-Barranco, G. Agnus, V. Derycke, J. P. Bourgoin, D.Vuillaume, J. Sohn, J. Bendall, M. E. Welland, and C. Gamrat, "Fast and Compact Simulation Models for a Variety of FET Nano Devices by the CMOS EKV Equations," IEEE NANO 2009, Genoa, Italy, July, 2009.

B. Linares-Barranco, and T. Serrano-Gotarredona, "Exploiting Memristance for Implementing Spike-Time-Dependent-Plasticity in Neuromorphic Nanotechnology Systems," Design of Circuits and Integrated Systems Conference 2009 (DCIS'09), Zaragoza, Spain, November, 2009.

T. Serrano-Gotarredona, B. Linares-Barranco, G. Agnus, V. Derycke, J. P. Bourgoin, D.Vuillaume, J. Sohn, J. Bendall, M. E. Welland, and C. Gamrat, "The EKV Equations as a Compact Model for Simulating a Variety of FET based Nano Devices," Design of Circuits and Integrated Systems Conference 2009 (DCIS'09), Zaragoza, Spain, November, 2009.

J. A. Leñero-Bardallo, T. Serrano-Gotarredona, and B. Linares-Barranco, "A Spatial Calibrated AER Contrast Retina with Adjustable Contrast Threshold," Design of Circuits and Integrated Systems Conference 2009 (DCIS'09), Zaragoza, Spain, November, 2009.

C. Zamarreño-Ramos, T. Serrano-Gotarredona, and B. Linares-Barranco, "Low Power LVDS Transceiver for AER Links with Burst Mode Operation Capability," Design of Circuits and Integrated Systems Conference 2009 (DCIS'09), Zaragoza, Spain, November, 2009.

L. A. Camuñas-Mesa, A. Linares-Barranco, A. J. Acosta-Jiménez, T. Serrano-Gotarredona, and B. Linares-Barranco, "Improved AER Convolution Chip for Vision Processing with Higher Resolution and New Functionalities," Design of Circuits and Integrated Systems Conference 2009 (DCIS'09), Zaragoza, Spain, November, 2009.

.

Book Chapters

Books

Shih-Chii Liu (2009-2010)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

"Artificial spike-based audition", Department of Electrical and Computer Engineering Seminar Series, Baltimore, Maryland, USA, Nov, 2009.

"Tracking using multi-modal information from spiking sensors", Department of Bioengineering Seminar, Imperial College, London, UK, June, 2009.

Professional Activities and Service

Chair of IEEE CAS Neural Systems and Applications Technical Committee (2009-2010)
Past-Chair of the IEEE CAS Sensory Systems Technical Committees (2009-2010).
Co-Editor of Special Issue of IEEE Transactions on Biomedical Systems in 2009
Vision Topic Co-Organizer, Telluride Neuromorphic Cognition Engineering Workshop, 2009
Track Co-Chairman, Sensory Systems Track, IEEE International Symposium on Circuits and Systems Conference, 2009.

Board Memberships:

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:

M. Oster, R. Douglas, and S.-C. Liu, "Computation with spikes in a winner-take-all network", Neural Computation, 21(9), pgs 2436--2465, 2009.

R. Serrano-Gotarredona, M. Oster, P. Lichtsteiner, A. Linares-Barranco, R. Paz-Vicente, F. Gomez-Rodriguez, L. Camunas-Mesa, R. Berner, M. Rivas, T. Delbruck, S-C. Liu, R. Douglas, P. Hafliger, G. Jimenez-Moreno, A. Civit, T. Serrano-Gotarredona, A. Acosta-Jimenez, and B. Linares-Barranco, "CAVIAR: A 45k-neuron, 5M-synapse, 12G-connects/sec AER hardware sensory-processing-learning-actuating system for high speed visual object recognition and tracking", IEEE Transactions on Neural Networks, 20(9), pgs 1417--1438, 2009.

Peer Reviewed Conference Papers:

Y. Wang and S.-C. Liu, "Input evoked nonlinearities in silicon dendritic circuits", IEEE International Symposium on Circuits and Systems, Taipei, Taiwan, pgs 2894-2897, May 24--27, 2009.

T. Yu, A. Schwartz, J. Harris, M. Slaney, and S-C. Liu, "Periodicity detection and localization using spike timing from the AER EAR", IEEE International Symposium on Circuits and Systems, Taipei, Taiwan, pgs 109-113, May 24--27, 2009.

A. Linares-Barranco, F. Gomez-Rodriguez, G. Jimenez, T. Delbruck, R. Berner, and S.-C. Liu, "Implementation of a time-warping AER mapper", IEEE International Symposium on Circuits and Systems, Taipei, Taiwan, pgs 2886-2889, May 24--27, 2009.

Book Chapters

R. Moeckel, and S-C Liu, "Motion detection chips for robotic platform", Flying Insects and Robots, D. Floreano, J-C. Zufferey, M. Srinivasan, and C. Ellington, eds, Chapter , pp. 101-114, Springer Berlin Heidelberg, ISBN: 978-3-540-89392-9.

Books

Karim G. Oweiss, PhD

INVITED TALKS & SEMINARS

Workshop on **Methods of Information Theory in Computational Neuroscience**, 19th annual Computational Neuroscience, San Antonio, Texas, July 29th, 2010

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

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

Department of Neurology, **University of Georgia**, February 23, 2010

Center for Brain Injury and Repair and Department of Neurosurgery, **University of Pennsylvania**, April 11, 2009

PROFESSIONAL ACTIVITIES

Associate Editor, IEEE Signal Processing Letters, 2009 – 2011
Associate Editor, Journal of Computational Intelligence and Neuroscience, 2006 – present
Associate Editor, IEEE Engineering in Med & Biology Conference Editorial Board (CEB): Neural & Rehabilitation Engineering theme, 2010 – 2012
Review Editor, Journal of *Frontiers in Neural Engineering*
Guest Editor, EURASIP Journal on Advances in Signal Processing 2008 -2010
Guest Editor, Journal of Computational Intelligence and Neuroscience, 2008-2010

Invited Session & Track Chairing

2010 32nd IEEE Engineering in Medicine & Biology Conference: "*Analysis of Neural Signals*" Track Chair

2009 43rd IEEE Asilomar Conference on Signals, Systems & Computers: "*Neural Signal Processing*" Session Chair

2009 34th IEEE ICASSP: "*Signal Processing for Neural Spike Trains*" Session Chair

Member, IEEE Signal Processing Society (SPS) Board of Directors' initiative on Brain Machine Interface Technology

Member, Institute of Electrical and Electronics Engineers (IEEE), 1995 – Present

Member, Society for Neuroscience, 2005 – Present

Member, IEEE Technical Committees on: Biomedical Circuits and Systems, Life-Science Systems and Applications, Neural Systems and Applications

Member, IEEE Engineering in Medicine and Biology Society

Grant Reviewer

Charter Member for the following NIH study sections:

NeuroTechnology: 2004-2010

NIH Human Brain Project IRG

NIH special emphasis panel on "Continued Development and Maintenance of Software" 2010

Clinical Neurophysiology, Devices and Neuroprosthetics/Brain Disorders IRG

Neuroinformatics IRG

ARRA Challenge Grants on Bioengineering Sciences and Technology

Emerging Technologies and Training in Neurosciences IRG

Department of Defense (DoD) Congressionally Directed Medical Research Programs (CDMRP), Spinal Cord Injury Research Program

National Science Foundation: Biomedical Engineering Panel

The American Institute of Biological Sciences

Maryland Technology Development Corporation (TEDCO)

Dutch Technology Foundation for academic research in applied sciences

Qatar Technology Foundation

Michigan State University Intramural Research Grants Program

Paper Referee

IEEE Transactions on Biomedical Engineering

IEEE Transactions on Biomedical Circuits & Systems

IEEE Transactions on Neural Systems and Rehabilitation Engineering

IEEE Transactions on Signal Processing

IEEE Transactions on Systems, Man and Cybernetics

IEEE Signal Processing Letters

IEEE Signal Processing Magazine

Journal of Neural Engineering

Journal of Neural Computation

Journal of Neuroscience Methods

Journal of Computational Neuroscience

Journal of Neurocomputing

Journal of Computational Intelligence and Neuroscience

EURASIP Journal of Advances in Signal Processing

EURASIP Journal on Embedded Systems

PUBLICATIONS

Books

K. Oweiss, *Statistical Signal Processing for Neuroscience and Neurotechnology*, DOI: 10.1016/B978-0-12-375027-3.00001-6, Elsevier Inc., 1st edition, August 2010 (in press)

Book Chapters

K. Oweiss & M. Aghagolzadeh, **"**Detection and Classification of Extracellular Action Potential Recordings," in *Statistical Signal Processing for Neuroscience and Neurotechnology,* DOI: 10.1016/B978-0-12-375027-3.00001-6, Elsevier Inc., 1st edition, pp: 13-68, August 2010 (in press)

S. Eldawlatly, **K. Oweiss**, "Graphical Models of Functional and Effective Neuronal Connectivity," in *Statistical Signal Processing for Neuroscience and Neurotechnology,* DOI: 10.1016/B978-0-12-375027-3.00001-6, Elsevier Inc., 1st edition, pp: 119-160, August 2010 (in press)

Peer-Reviewed Journal Publications

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

S. Eldawlatly, Y. Zhou, R. Jin and **K. Oweiss**, "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, Jan 2010

M. Aghagolzadeh and **K. Oweiss**, "Compressed and Distributed Sensing of Neuronal Activity for Real Time Spike Train Decoding", *IEEE Transactions on Neural Systems & Rehabilitation Engineering*, 17:2, pp. 416-427, Apr 2009

S. Eldawlatly, R. Jin, and **K. Oweiss**, "Identifying Functional Connectivity in Large Scale Neural Ensemble Recordings: A Multiscale Data Mining Approach", *Journal of Neural Computation*, MIT Press, 21:2, pp. 450-477, Feb 2009

International Peer-reviewed Conference Papers

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), December 2010, *to appear*

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),* July 2010, *to appear*

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),* August 2010, *to appear*

A. Kamboh, Y. Yang, **K. Oweiss**, A. Mason, "Design of a Configurable Neural Data Compression System for IntraCortical Implants," *Proc. of IEEE Int. Symp. on Circuits & Systems (ISCAS)*, 2010, *to appear*

M. Aghagolzadeh, S. Eldawlatly, and **K. Oweiss** "A hypergraph-based approach to identify the role of higher-order interaction between cortical neurons in stimulus coding "*in Proc. 43rd Asilomar IEEE Int. Conference on Signals, Systems, and Computers, Pacific Grove, CA, 2009*

M. Aghagolzadeh, S. Eldawlatly, and **K. Oweiss** "Coding Stimulus Information with Cooperative Neural Populations," in *Proc. of IEEE Int. Symposium on Information Theory*, pp. 1594 – 1598, 2009

S. Eldawlatly, Y. Zhou, R. Jin, **K. Oweiss**, "Inferring Functional Cortical Networks from Spike Train Ensembles using Dynamic Bayesian Networks," in *Proc of IEEE Int. Conf. Acoustics, Speech & Signal Processing* (ICASSP), pp. 3489-3492, 2009

M. Aghagolzadeh, **K. Oweiss**, "Instantaneous rate estimation of Neuronal Point processes from a Compressed representation of their non-binary spike trains " in *Proc IEEE Int. Conf. Acoustics, Speech & Signal Processing* (ICASSP), pp. 1593 – 1596, 2009

A. M. Kamboh, **K. Oweiss**, A. Mason, "Resource Constrained VLSI Architecture for Implantable Neural Data Compression Systems," *Proc. of IEEE Int. Symp. On Circuits & Systems (ISCAS)*, pp. 1481 - 1484, May 2009

F. Abu-Nimeh, F. Inanlou, M. Aghagolzadeh, A. Kamboh, A. Mason, M. Ghovanloo, and **K. Oweiss**, "A highly modular, wireless, Implantable Interface to the Cortex," *Proc. IEEE Int. Conf. on Neural Engineering*, 375 – 378, May 2009

M. Aghagolzadeh, S. Eldawlatly, **K. Oweiss** "Identifying Functional Connectivity of Motor Neuronal Ensembles Improves the Performance of Population Decoders," *Proc. IEEE Int. Conf. on Neural Engineering*, pp. 534 – 537, May 2009

K.Y. Kwon, S. Eldawlatly and **K. Oweiss**, "NeuroQuest: A Comprehensive Tool for Large Scale Neural Data Processing and Analysis" *Proc. IEEE Int. Conf. on Neural Engineering*, pp 622 – 625, May 2009

J. Liu, H. Khalil, and **K. Oweiss**, "Feedback Control of the Spatiotemporal Firing Pattern of a Basal Ganglia Microcircuit Model," in *Proc. of 19th Conference on Computational Neuroscience*, July 2010, *to appear*

S. Eldawlatly and **K. Oweiss**, "Causal networks in the rat barrel cortex provide a signature of stimulus encoding," in *Proc. of 19th Conference on Computational Neuroscience*, July 2010, *to appear*

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

S. Eldawlatly, S. Fujisawa, G. Buzsáki, **K. Oweiss** "Identifying position-specific functional networks in the rat medial prefrontal cortex," *Society for Neuroscience Abstracts*, No 192.9, October 2009.

M. Aghagolzadeh , S. Eldawlatly, **K. Oweiss**, "The role of higher-order interactions between cortical neurons in a model of sensorimotor integration," *Society for Neuroscience Abstracts*, No 789.11, October 2009.

K. Y. Kwon, S. Eldawlatly, **K. Oweiss**, "NeuroQuest: A comprehensive tool for large scale neural signal processing and analysis," *Society for Neuroscience Abstracts*, No 790.10, October 2009.

F. T. Abu-Nimeh, M. Aghagolzadeh, **K. Oweiss**, "Real-time, on-chip spike sorting and firing rate estimation for cortically-controlled Brain Machine Interface applications," *Society for Neuroscience Abstracts*, No 181.14, October 2009.

Jonne K. Poikonen (2009-2010)

Professional Activities and Service

Member of the IEEE CASS Sensory System technical Committee (SSTC)
Journal reviews: IEEE Transactions on Circuits and Systems I, IEEE Transactions on Neural Networks
Conference reviews: ISCAS, CNNA, ECCTD

Publications

Peer Reviewed Papers:

J. Poikonen, A. Paasio, "An 8x8 Cell Analog Order Statistic Filter Array with Asynchronous Grayscale Morphology in 0.13 μm CMOS", IEEE Transactions on Circuits and Systems I: Regular Papers, Vol. 56, No. 8, pp. 1541-1553, August 2009.

J. Poikonen, M. Laiho, A. Paasio, L. Koskinen, K. Halonen, "An Analog Processor Array Implementing Interconnect-Efficient Reference Data Shift and SAD/SSD Extraction for Motion Estimation", EURASIP Journal on Advances in Signal Processing, vol. 2009, Article ID 127630, 2009.

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J. Poikonen, M. Laiho, A. Paasio, "MIPA4k: a 64x64 Cell Mixed-Mode Image Processor Array", Proc. of the IEEE International Symposium on Circuits and Systems, Taipei, Taiwan, May 2009.

J. Poikonen, M. Laiho, P. Virta, A. Paasio, "Live Demonstration: MIPA4k: a 64x64 Cell Mixed-Mode Image Processor Array", Proc. of the IEEE International Symposium on Circuits and Systems, Taipei, Taiwan, May 2009.

J. Marku, J. Poikonen, A. Paasio, "Temperature Compensation in Combination Selection Based Mismatch Calibration", Proc. of the IEEE International Symposium on Circuits and Systems, Taipei, Taiwan, May 2009.

J. Poikonen, M. Laiho, A. Paasio, "Locally Adaptive Image Sensing with the 64x64 Cell MIPA4k Mixed-Mode Image Processor Array", Proc. of the European Conference on Circuit Theory and Design, ECCTD 2009, Antalya, Turkey, August 2009.

M. Laiho, J. Poikonen, A, Paasio, "Space-Dependent Binary Image Processing Within a 64x64 Mixed-Mode Array Processor, Proc. of the European Conference on Circuit Theory and Design, ECCTD 2009, Antalya, Turkey, August 2009.

M. Grönholm, J. Poikonen, M. Laiho, "A Ring-Oscillator-Based Active Quenching and Active Recharge Circuit for Single Photon Avalanche Diodes", Proc. of the European Conference on Circuit Theory and Design, ECCTD 2009, Antalya, Turkey, August 2009.

J. Marku, J. Poikonen, A. Paasio, "Temperature Compensation in Current Source Mismatch Calibration in 65 nm Technology, Proc. of the International System-on-Chip conference, Belfast, Northern Ireland, UK, 2009.

J. Poikonen, M. Laiho, A. Paasio, "Anisotropic filtering with a resistive fuse network on the MIPA4k processor Array", Proc. of the IEEE International Workshop on Nanoscale Networks and their Applications, CNNA 2010, Berkeley, California, USA, February 2010. (Extended abstract peer review)

M. Laiho, J. Poikonen, A. Paasio, " Object segmentation and tracking with asynchronous grayscale and binary wave operations on the MIPA4k", Proc. of the IEEE International Workshop on Nanoscale Networks and their Applications, CNNA 2010, Berkeley, California, USA, February 2010. (Extended abstract peer review)

O. Lahdenoja, J. Poikonen, M. Laiho, "Extracting Local Binary Patterns with MIPA4k Vision Processor", Proc. of the IEEE International Workshop on Nanoscale Networks and their Applications, CNNA 2010, Berkeley, California, USA, February 2010. (Extended abstract peer review)

E. Lehtonen, J. H. Poikonen, J. K. Poikonen, M. Laiho, "Grayscale CNN Computation of Boolean Functions", IEEE Latin American Symposium on Circuits and Systems, LASCAS 2010, Brasil, February 2010.

L. Koskinen, J. Poikonen, M. Laiho, A. Paasio, "Rate-distortion performance analysis of an analog motion estimation array", Proc. of the IEEE International Conference on Acoustics, Speech, and Signal Processing, ICASSP 2010, Dallas, Texas, March 2010.

Christoph Posch (2009-2010)

IEEE Services

Professional Activities and Service

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

Review Committee Member ISCAS 2010

Awards, Honors, Patents:

1st Honorary Mention, Best Paper Award SSTC, ISCAS 2009

Publications

Peer Reviewed Papers:

Posch, C.; Matolin, D.; Wohlgenannt, R., "A Two-Stage Capacitive-Feedback Differencing Amplifier for Temporal Contrast IR Sensors", *Analog Integrated Circuits and Signal Processing*, DOI: 10.1007/s10470-009-9354-2, Springer, 2009.

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S. Abdullin et al., "The CMS barrel calorimeter response to particle beams from 2 to 350 GeV/c", *Eur. Phys. J. C* 60 3 (2009) 359-373, doi: 10.1140/epjc/s10052-009-0959-5, Apr. 2009.

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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.

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.

Hofstaetter, M.; Schön, P.; Posch, C., "A SPARC-Compatible General Purpose Address-Event Processor with 20-Bit 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.

Matolin, D.; Posch, C.; Wohlgenannt, R., "Correlated Double Sampling and Comparator Design for Time-Based Image Sensors", *Circuits and Systems, ISCAS 2009. IEEE International Symposium on*, pp.1269-1272, 18-21 May 2009.
1st Honorary Mention, Best Paper Award SSTC, ISCAS 2009

Hofstätter, M.; Schön, P.; Posch, C., "An integrated 20-bit 33/5M events/s AER sensor interface with 10ns time-stamping and hardware-accelerated event pre-processing", *Biomedical Circuits and Systems Conference, 2009. BioCAS 2009. IEEE*, Nov. 2009.

Matolin, D.; Posch, C.,"Area and Power Reduction Techniques for Time-based Image Sensor Pixel Design", *Microelectronics, 2009. ICM '09. IEEE International Conference on*, pp., 19-22 Dec. 2009.

Book Chapters

Posch, C., "Detectors, Pixels and Signal-Processing", in "Smart Cameras", ISBN 1441909524, 1. Ed., Springer, Nov. 2009

Mohamad Sawan (2009-2010)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Sawan, M., "Biomedical Circuits and Microsystems for Wireless Intracortical Biosensing and Treatment", Tutorial at The Int'l Conference on Electronics, Circuits and Systems (ICECS), Tunisia, Dec. 2009.

Sawan, M., "Circuits and Microsystems for Intracortical Multichannel ENG Recording and Wireless Transmission", Invited talk at a Université de Montpellier II, Montpellier, France, March 2010.

Sawan, M., "Intracortical Microsystems for Wireless Biosensing and Visual Microstimulation", Invited talk at Computer Science & Engineering Colloquium, Washington University, St-Louis, USA, Sept. 2009.

Sawan, M., "Emerging CMOS-Based biosensing technologies", Tutorial at The Symposium on Integrated Circuits and Systems Design (SBCCI), Brazil, Sept. 2009.

Sawan, M., "Brain-machine interface: 3D-IC for intracortical recording and wireless transmission", Invited talk at the System Design for 3D Silicon Integration Workshop (D43D), Grenoble, June 2009.

Sawan, M., "Microsystèmes médicaux implantables : défis de conception et d'intégration", Invited Talk at ACFAS, Ottawa, May 2009.

Sawan, M., "Intracortical Wireless Microsystems for Biosensing and Neurostimulation", Tutorial at The GLSVLSI, Boston, USA, May 2009.

Professional Activities and Service

Member of the IEEE CAS Biocas, Sensors and Technical Committees
Member of the Technical Committee for the IEEE BioCAS conference

Member of the Steering Committee for the IEEE TBioCAS.
Member of the Steering Committee for the IEEE ICECS.
AE of the IEEE TBioCAS

Board Memberships:

IEEE Board of Governors of IEEE Circuits and Systems Society

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:

GHAFAR-ZADEH, E., SAWAN, M., CHODAVARAPU, V.P., " Differential Monitoring of Bacteria Growth using CMOS Capacitive Sensor", IEEE Trans. on Biomedical Circuits & Systems, In Press, 2010.

TARIQUS-SALAM, M., SAWAN, M., NGUYEN, D., "An alternative treatment for epilepsy: low-power implantable device", The Journal of Healthcare Engineering, In Press, 2010.

HASHEMI, S., SAWAN, M., SAVARIA, Y., "A Novel Low-Drop Voltage CMOS Active Rectifier for RF Powered Devices: Experimental Results", Elsevier Microelectronics Journal, Vol. 40, No. 11 2009, pp. 1547-1554.

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ETHIER, S., SAWAN, M., M., EL-GAMAL, M. "A Novel Energy-Efficient Stimuli Generator for Very-High Impedance Intracortical Microstimulation", IEEE-ISCAS, Paris, France, May 2010.

AL-TERKAWI-HASIB, O., SAWAN, M., SAVARIA, Y., "Fully Integrated Ultra-Low-Power Asynchronously Driven Step-Down DC-DC Converter", IEEE-ISCAS, Paris, France, May 2010.

TARIQUS-SALAM, M., SAWAN, M., NGUYEN, D., HAMOUI, A., "Epileptic Low-Voltage Fast-Activity Seizure-Onset Detector", Invited paper at the IEEE-Int'l Biomedical Circuits and Systems (BiOCAS), Beijing, China, Nov. 2009.

MOUNAIM, F., SAWAN, M., "Integrated inductive power and data recovery front-end dedicated to implantable devices", IEEE-BiOCAS Conference, Beijing, China, Nov. 2009.

ETHIER, S., SAWAN, M., ABOULHAMID, M., EL-GAMAL, M. "A ±9 V Fully Integrated CMOS Current Source for High-Impedance Microstimulation", IEEE-MWSCAS, Cancun, Mexico, August 2009.

WEHBE, M., SAWAN, M. "Dynamic Pupil Reacting to Incident Light Dedicated to Ocular Implants", IEEE-MWSCAS, Cancun, Mexico, August 2009.

HASHEMI, S., SAWAN, M., SAVARIA, Y., "Fully-Integrated Low-Voltage High-Efficiency CMOS Rectifier for Wirelessly Powered Devices", IEEE-NEWCAS, Toulouse, France, June 2009.

GOSSELIN, M., SAWAN, M., "Event-Driven Data and Power Management in High-Density Neural Recording Microsystems", Invited paper at IEEE-NEWCAS, Toulouse, France, June 2009.

AIT YACOUB, M., SAWAN, M., THIBEAULT, C., "A Neuromimetic Ultra low-power ADC for Bio-Sensing Applications", IEEE-NEWCAS, Toulouse, France, June 2009.

MILED, A., Sawan, M., "Reconfigurable Dielectrophoretic Device for Neurotransmitters Sensing and Manipulation", the IEEE Mixed-Signals, Sensors and Systems Test Workshop, Scottsdale, June 2009.

Book Chapters

GOSSELIN, B., SAWAN, M., "Embedded Medical Microsystems: Neural recording implants", Heterogeneous Embedded Systems: Design Theory and Practice, Book Chapter, To appear, Springer, 2010.

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Books

GHAFAR-ZADEH, E., SAWAN, M., "CMOS Capacitive Sensors for Lab-On-Chip Applications", *Book, **Springer Editor***, 2010, 250p.

André van Schaik (2009-2010)

IEEE Services

Professional Activities and Service

Member of the IEEE CAS Analogue, Biocas and Sensors Technical Committees.
Past Chair, IEEE CAS Sensors TC

Board Memberships:

2006 – 2009 IEEE Trans. on Circuits and Systems I, Associate Editor
2010   IEEE ISCAS Review Committee member.

Publications

Peer Reviewed Papers:

A. Kan, C. Jin, and A. van Schaik "A psychophysical evaluation of near-field virtual auditory space derived from far-field head-related transfer functions," *Journal of the Acoustical Society of America*, Vol 125, No 4, 2009, pp 2233-2242. (5yIF=2.018, cited=0)

J. Tapson, C. Jin, A. van Schaik, and R. Etienne-Cummings, "A First-Order Non-Homogeneous Markov Model for Integrate-and-Fire Neurons Stimulated by Small Phase-Continuous Signals," *Neural Computation*, Vol 21, No 6, 2009. (5yIF=3.336, cited=1)

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S. Jeganathan, C. Jin, A. van Schaik, and A. McEwan, "Suitability of the INPHAZE impedance analyzer for Bio-impedance and EIT," *Journal of Physics Conference Series*, accepted Jan 2010.

Peer Reviewed Conference Papers:

A. van Schaik, V. Chan, and C. Jin, "Sound Localisation with a Silicon Cochlea Pair," *International Conference on Acoustics, Speech and Signal Processing*, Taipei, Taiwan, April 2009.

A. Parthy, C. Jin, and A. van Schaik "Acoustic Holography with a Concentric Rigid and Open Spherical Microphone Array," *International Conference on Acoustics, Speech and Signal Processing* Taipei, Taiwan, April 2009.

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A. van Schaik, C. Jin, T.J. Hamilton, S. Mihalas, and E. Niebur, "A log-domain implementation of the Mihalas-Niebur neuron model," accepted for *ISCAS2010*, May 2010.

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J. Tapson, T.J. Hamilton, and A. van Schaik, "The Self-Tuned Regenerative Electromechanical Parametric Amplfier: A Model for Active Amplification in the Cochlea," accepted for *ISCAS2010*, May 2010.

T.J. Hamilton, J. Tapson, C. Jin, and A. van Schaik, "Investigating the implications of Outer Hair Cell connectivity using a Silicon Cochlea," accepted for *ISCAS2010*, May 2010.

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A. van Schaik, T.J. Hamilton, and C. Jin, "Silicon Models of the Auditory Pathway," *in Computational Models of the Auditory System, Springer Handbook of Auditory Research, Vol. 35,* edited by Meddis, R.; Lopez-Poveda, E.A.; Fay, R.R.; Popper, A.N., 2010, Ch 10. *In press, accepted August 2009, to appear in April 2010.*

G. Gargiulo, P. Bifulco, R.A. Calvo, M. Cesarelli, C. Jin, A. McEwan and A. van Schaik, "Non-invasive Electronic Biosensor Circuits and Systems." In *Intelligent and Biosensors*, IN-TECH, ISBN 978-953-7619-X-X. *In press, accepted November 2009.*

A. Kan, C. Jin, and A. van Schaik, "Psychoacoustic evaluation of different methods for creating individualized, headphone-presented VAS from B-format RIRs," World Scientific, *In press, to appear mid 2010.*

Patents

J. Leung, C. Jin, S. Carlile, and A. van Schaik, "Recording a three dimensional auditory scene and reproducing it for the listner," United States Patent US7489788, February 10, 2009.

C. Jin, P. Leong, J. Leung, S. Carlile, and A. van Schaik, "Generation Of Customised Three Dimensional Sound Effects For Individuals," United States Patent 7542574, June 2, 2009

McEwan A., Tapson J., van Schaik A. and Holder D.S, "System and Method for Conducting Multiplexed Electrical Impedance Tomography" World Patent Office, WO2009068961, July 16, 2009.

S. Carlile, C. Jin, J. Leung, and A. van Schaik, "Sound enhancement for hearing impaired listeners," Austrian Patent AT452513, January 15, 2010

Teresa Serrano-Gotarredona (2009-2010)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Professional Activities and Service

Secretary-Elect of IEEE Sensory Systems Technical Committee
Member of Review Program Committee: ISCAS
Academic Editor, PLOS-One, May 2008-Present
Reviewer: IEEE TCAS I&II, IEEE TNN, ISCAS, Midwest, PLOS one
Track Co-Chair for Sensory Systems of the biennial Asia Pacific Conference on Circuits and Systems APCCAS

Board Memberships:

IEEE International Symposium on Circuits and Systems, Special Session Co-organizer "Neuromorphic Nano Devices Adaptive Sensing & Processing Systems", (May 2010)

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:

G. Vicente-Sánchez, J. Velarde-Ramírez, T. Serrano-Gotarredona, and B. Linares-Barranco, "A Weak-to-Strong Mismatch Model for Analog Circuit Design," Int. Journal of Analog Integrated Circuits and Signal Processing, vol. 59, pp. 325-340, 2009.

Rafael Serrano-Gotarredona, M. Oster, P. Lichteiner, A. Linares-Barranco, R. Paz-Vicente, F. Gomez-Rodriguez, L. Camuñas-Mesa, R. Berner, M. Rivas, T. Delbruck, C. S. Liu, P. Halfinger, G. Jimenez-Moreno, A. Civit, T. Serrano-Gotarredona, A. Acosta-Jiménez, and B. Linares-Barranco, "CAVIAR: A 45K-neuron 5M-synapse 12G-connections/second AER hardware sensory-processing-learning-actuating system for high-speed visual object recognition and tracking," IEEE Trans. on Neural Networks, vol. 20, no. 9, pp. 1417-1438, September 2009.

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.

J. Perez-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. on Neural Networks, in press.

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J. A. Leñero-Bardallo, T. Serrano-Gotarredona, and B. Linares-Barranco, "A Mismatch Calibrated Bipolar Spatial-Contrast AER Retina with Adjustable Contrast Threshold," IEEE International Symposium on Circuits and Systems, ISCAS 2009, Taipei, May, 2009.

C. Zamarreño-Ramos, T. Serrano-Gotarredona, and B. Linares-Barranco, "OTA-C Oscillator with Low Frequency Variations for On-Chip Clock Generation in Serial LVDS-AER Links," IEEE International Symposium on Circuits and Systems, ISCAS 2009, Taipei, May, 2009.

B. Linares-Barranco, and T. Serrano-Gotarredona, "Exploiting Memristance in Adaptive Asynchronous Spiking Neuromorphic Nanotechnology Systems," IEEE NANO 2009, Genoa, Italy, July, 2009.

T. Serrano-Gotarredona, B. Linares-Barranco, G. Agnus, V. Derycke, J. P. Bourgoin, D.Vuillaume, J. Sohn, J. Bendall, M. E. Welland, and C. Gamrat, "Fast and Compact Simulation Models for a Variety of FET Nano Devices by the CMOS EKV Equations," IEEE NANO 2009, Genoa, Italy, July, 2009.

B. Linares-Barranco, and T. Serrano-Gotarredona, "Exploiting Memristance for Implementing Spike-Time-Dependent-Plasticity in Neuromorphic Nanotechnology Systems," Design of Circuits and Integrated Systems Conference 2009 (DCIS'09), Zaragoza, Spain, November, 2009.

T. Serrano-Gotarredona, B. Linares-Barranco, G. Agnus, V. Derycke, J. P. Bourgoin, D.Vuillaume, J. Sohn, J. Bendall, M. E. Welland, and C. Gamrat, "The EKV Equations as a Compact Model for Simulating a Variety of FET based Nano Devices," Design of Circuits and Integrated Systems Conference 2009 (DCIS'09), Zaragoza, Spain, November, 2009.

J. A. Leñero-Bardallo, T. Serrano-Gotarredona, and B. Linares-Barranco, "A Spatial Calibrated AER Contrast Retina with Adjustable Contrast Threshold," Design of Circuits and Integrated Systems Conference 2009 (DCIS'09), Zaragoza, Spain, November, 2009.

C. Zamarreño-Ramos, T. Serrano-Gotarredona, and B. Linares-Barranco, "Low Power LVDS Transceiver for AER Links with Burst Mode Operation Capability," Design of Circuits and Integrated Systems Conference 2009 (DCIS'09), Zaragoza, Spain, November, 2009.

L. A. Camuñas-Mesa, A. Linares-Barranco, A. J. Acosta-Jiménez, T. Serrano-Gotarredona, and B. Linares-Barranco, "Improved AER Convolution Chip for Vision Processing with Higher Resolution and New Functionalities," Design of Circuits and Integrated Systems Conference 2009 (DCIS'09), Zaragoza, Spain, November, 2009.

Book Chapters

Books

Shoushun Chen (2009-2010)

Professional Activities and Service

Reviewer:
Journals: IEEE Sensors, IEEE TCAS-II, IEEE TCAS-I, IEEE TVLSI, IEEE TBioCAS,
Conferences: ISCAS 2010, BIOCAS 2009, ISIC 2009

Workshops/Conferences/Panels/Invited Talks

Co-Organizer: Session on Integrated Circuits: Digital IC II and Session on Integrated Systems: System-on-Chip, 12th International Symposium on Integrated Circuits, Singapore, Dec 2009

Publications

Journal papers

Shoushun Chen, Amine Bermak and Wang Yan, "A Time-to-First-Spike Digital Pixel Sensor with on-chip image compression based on Predictive Boundary Adaptation and Least Memory QTD Algorithm," accepted at IEEE Transactions on Very Large Scale Integration Systems.

Conference papers

Shoushun Chen, Wei Tang and Eugenio Culurciello, " A 64x64 Pixels UWB Wireless Temporal-Difference Digital Image Sensor," accepted at the IEEE International Symposium on Circuits and Systems (ISCAS), Paris, June. 2010 (with live demo).

Shoushun Chen, Polina Akselrod and Eugenio Culurciello, "A Biologically Inspired System for Human Posture Recognition," the IEEE Biomedical Circuits and Systems Conference (BIOCAS), pp.113- 116, Beijing, Nov. 2009.

Shoushun Chen, Berin Martini and Eugenio Culurciello, "A Bio-inspired Event-based Size and Position Invariant Human Posture Recognition Algorithm," the IEEE International Symposium on Circuits and Systems (ISCAS), pp.775-778, Taipei, May 2009 (with live demo).

Milutin Stanacevic (2009-2010)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Milutin Stanacevic, Invited Talk, Michigan State University, Lansing, April 2010.

Milutin Stanacevic, "Micropower Adaptive VLSI Systems for Acoustic Source Detection, Localization and Separation", Invited Speaker, *CMOS Emerging Technologies Workshop*, Sep. 2009.

Professional Activities and Service

Member of the IEEE CAS Biocas, Neural Systems & Applications and Sensors Technical Committees (2005– present).

Member of the Technical Program Committee for the IEEE BioCAS conference (2008-present)

Member of the Technical Program Committee for the Argentine School of Micro-Nanoelectronics, Technology and Applications(EAMTA) (2008-present)

Awards, Honors, Patents:

NSF Faculty Early Career Development (CAREER) Award 2009

Publications

Peer Reviewed Papers:

L. Wang, K. Kalyanasundaram, M. Stanacevic and P. Gouma, "Nanosensor Device for Breath Acetone Detection", Sensors Letters, vol. 8, pp. 1 – 4, 2010.

P. Gouma, K. Kalyanasundaram, L. Wang, X. Yun and M. Stanacevic, "Nanosensor and Breath Analyzer for Ammonia Detection in Exhaled Human Breath", IEEE Sensor Journal, vol. 10(1), pp. 49– 53, 2010.

Peer Reviewed Conference Papers:

S. Li, X. Yun and M. Stanacevic, "Low-power System-on-chip Acoustic Localizer", Proc. 53rd. IEEE Midwest Symp. On Circuits and Systems (MWSCAS'2010), Seattle, WA, August 1-4, 2010.

X. Yun, S. Luryi and M. Stanacevic, "Low-power Charge Sensitive Amplifier for Semiconductor Scintillator", Proc. IEEE Int. Symp. Circuits and Systems (ISCAS'2010), Paris, France, May, 2010.

Book Chapters

'Integrated Microsystems: Emerging materials, MEMs, Photonic and Bio Interfaces', ed. Krzysztof Iniewski, chapter Micropower Adaptive VLSI Systems for Acoustic Source Detection, Localization and Separation", M. Stanacevic and G. Cauwenberghs, to be published

Orly Yadid-Pecht (2009-2010)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

"Advances in a CMOS Image Sensor based miniature Fluorescence Detection System for Biosensing Applications", invited for Delft University Workshop on Imaging, December 2009.

"Wide dynamic range sensors – progress in extension on both high and low level sides", invited for Hong Kong University Workshop, November 2009.

Professional Activities and Service

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:

2007 – 2009 IEEE Trans. on BioMedical Circuits and Systems Associate Editor
2006-present IEEE Sensors Council – Circuits and Systems Society Representative, Board Member (2006-present)
IEEE Sensors Conference, Christchurch, New Zealand, Special Session Co-organizer "Design Methodologies for Low Power Sensory and Memory Arrays", (October 2009)

Awards, Honors, Patents:

2009 iCORE Professorship in "Integrated Sensors and Intelligent Systems"

Publications

Peer Reviewed Papers:

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

M.P. Mintchev, M.G. Deneva, B.I. Aminkov, M. Fattouche, O. Yadid-Pecht, R.C. Bray, "Pilot study of temporary controllable gastric pseudobezoars for dynamic non-invasive gastric volume reduction", Physiological Measurement, December 2009, online, http://stacks.iop.org/0967-3334/31/131.

A. Spivak, a. Belenky, A. Fish, O. Yadid-Pecht, "Wide Dynamic Range CMOS Image Sensors – Comparative Performance Analysis", IEEE Transactions on Electron Devices, 2009, Vol. 56, Issue 11, pp. 2445-2461.

X. Li, Y. Shoshan, A. Fish, G. A. Jullien, O. Yadid-Pecht, "Hardware Implementations of Video Watermarking", International Journal on Information Technologies and Knowledge, June 2009, Vol. 5, pp. 9-16.

Peer Reviewed Conference Papers:

A. Teman, O. Yadid-Pecht, A. Fish, "An Improved AB^{2}C Scheme for Leakage Power Reduction in Image Sensors with On-chip Memory", IEEE Sensors Conference, Christchurch, New Zealand, October 2009.

N. Kopeika, A. Abramovich, H. Joseph, A. Akram, O. Yadid-Pecht, a. Belenky, S. Lineykin, "THz Imaging Using Inexpensive Glow Discharge Detector Pixels", IEEE COMCA 1009 Digest Article, Accepted.

I. Shcherback, E. Gan, L. Blockstein, O. Yadid-Pecht, "Image Sensor Sensitivity Improvement via Cumulative Crosstalk Reduction", CCDS and Advanced Image Sensors Workshop, Norway, June 2009.

S. Fisher, A. Teman, D. Vaysman, A. Gertsman, O. Yadid-Pecht, A. Fish, "Ultra-Low Power Subthreshold Flip Flop Design", IEEE International Symposium on Circuits and Systems (ISCAS'09) Taipei, Taiwan, May 2009, pp. 1573-1576.

A. Belenky, A. Spivak, A. Fish, O. Yadid-Pecht, "A Wide Dynamic Range CMOS Image Sensor with Gating for Night Vision Systems", IEEE International Symposium on Circuits and Systems (ISCAS'09, Taipei, Taiwan, May 2009, CD Rom.

Book Chapters

Books

Jie (George) Yuan (2009-2010)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

"Mixed-signal IC Techniques for Bio-Medical Applications", TIMA Laboratories, Jul. 2, 2009, France
"Mixed-signal IC techniques for cell recording", Molecular Medicine Institute, Peking University, China, Nov. 11, 2009

Professional Activities and Service

Secretary   Biomedical Circuits and System Technical Committee of IEEE CAS society
Technical Program Co-chair   IEEE Biomedical Circuits and Systems Conference,   Nov. 2009
Technical Committee Member   IEEE Symposium on Circuits and Systems,   2008-2010

Board Memberships:

Guest Editor   IEEE Transaction on Biomedical Circuits and Systems

Awards, Honors, Patents:

3rd prize, Student paper competition, EMBS Hong Kong Chapter, Ruoyu Xu, Hongjie Zhu, and Jie Yuan, "High-speed intra-body communication", Aug. 2009

Jie Yuan, Ho Yeung Chan, "Apparatus and method for improving dynamic range and linearity of CMOS image sensor", US patent application, pending, filed Jan. 29, 2010

Publications

Peer Reviewed Papers:

J. Yuan, *H.Chan, S.W. Fung, B. Liu*, "An Activity-Triggered 95.3dB DR -75.6dB THD CMOS Imaging Sensor with Digital Calibration", *IEEE Journal of Solid-State Circuits* (JSSC), Vol. 44, pp. 2834-2843, Oct. 2009.

J. Yuan, *H.Chan, S.W. Fung, B. Liu*, "Digital Calibration Technique for A Highly Linear Wide Dynamic Range CMOS Imaging Sensor", *IEE Electronics Letters,* Vol. 45, No. 9, pp. 449-451, Apr. 2009

J. Yuan, N. Song, N. Farhat, J. Van der Spiegel, "The Low-Power Element Design for a Spatio-Temporal Pattern Clustering System", *Analog Integrated Circuits and Signal Processing,* Vol. 59, pp. 287-300, No. 3, Jun. 2009

J. Yuan, "Modeling, Quantitative Analysis and Design of Switched-Current Pipeline A/D Converters", *IEEE Trans. Circuits and Systems I: Regular Papers* (TCAS-I), Vol. 56, pp. 727-739, Apr. 2009

Peer Reviewed Conference Papers:

J. Guo, B. Liu, and J. Yuan, "Wide dynamic range front-end amplifier for cell recording with microelectrode arrays", *2009 IEEE Biomedical Circuits and Systems Conference* (BioCAS), pp. 65-68, Nov. 26-28, 2009

R. Xu, H. Zhu, and J. Yuan, "Circuit-coupled FEM analysis of the electrical-field type intra-body communication channel", *2009 IEEE Biomedical Circuits and Systems Conference* (BioCAS), pp. 221-224, Nov. 26-28, 2009

L. Chen, R. Xu, and J. Yuan, "An efficient Bscan-sample-based SD beamformer for medical ultrasound imaging", *2009 IEEE Biomedical Circuits and Systems Conference* (BioCAS), pp. 285-288, Nov. 26-28, 2009

H. Zhu, R. Xu, and J. Yuan, "High Speed Intra-Body Communication for Personal Health Care", *31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society* (EMBC), pp. 709-712, Sep. 3-6, 2009

R. Xu, H. Zhu, J. Yuan, "Characterization and Analysis of Intra-body Communication Channel", *2009 IEEE International Symposium on Antennas and Propagation* (APS), pp. 1-4, Jun. 1-5, 2009

B. Liu, and J. Yuan, "A Wide Dynamic Range High-Linearity In-Pixel Data Acquisition Front-End for Computed Tomography", *2009 IEEE International Symposium on Circuits and Systems* (ISCAS), pp. 2301-2304, May 24-27, Taipei, Taiwan, 2009

S. Fung, B. Liu, J. Yuan, and Q. Guo*, "A Low-Noise Monolithic CMOS Bio-Potential Detector", *2009 IEEE International Symposium on Circuits and Systems* (ISCAS), pp. 653-656, May 24-27, Taipei, Taiwan, 2009

H. Chan, and J. Yuan, "Activity-Based Wide Dynamic Range Highly Linear CMOS Imaging Sensor", *2009 International Solid-State Circuits Conference* (ISSCC) *Student Forum*, San Francisco, Feb. 8, 2009

Jacob Vogelstein (2009-2010)

Conferences or workshops:

Bridging the Gap: Integrating Radiology and Pathology in the Study of Viral Infections

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

Invited Lecture: "NeuroCognitive Graph Theory" at *Bridging the Gap*, February 9, 2010, sponsored by NIH
Distinguished Lecturer in 2009-2010:

Editorial Service:

ISCAS 2010, TBCAS, NIPS, EMBC 2009

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

Journal Articles

S. S. Kim, A. P. Sripati, **R. J. Vogelstein**, R. S. Armiger, A. F. Russell, and S. J. Bensmaia, "Conveying tactile feedback in sensorized hand neuroprostheses using a biofidelic model of mechanotransduction," *IEEE Transactions on Biomedical Circuits and Systems,* vol. 3, no. 6, pp. 398–404, 2009.

Conference Papers

R. J. Vogelstein, R. Etienne-Cummings, and A. H. Cohen, "Phase-based control of the central pattern generator for locomotion," *Proceedings of the 31st Annual International IEEE EMBS Conference of the IEEE Engineering in Medicine and Biology Society* (Minneapolis, MN), 2009.

A. F. Russell, R. S. Armiger, R. J. Vogelstein, S. J. Bensmaia, and R. Etienne-Cummings, "Real-time implementation of a biofidelic SA1 model for tactile feedback," *Proceedings of the 31st Annual International IEEE EMBS Conference of the IEEE Engineering in Medicine and Biology Society* (Minneapolis, MN), 2009.

Denise Wilson (2009-2010)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Denise Wilson, Ella Kliger, and Ralph Scott, "The Truth about Air Fresheners and Air Care Products," Roundtable/Panel Workshop, *National Environmental Health Association Conference:* Atlanta, Georgia, June 2009.
Ella Kliger and Denise Wilson, "Managing Mold After a Flood," Hands-On Learning Laboratory, *National Environmental Health Association Conference:* Atlanta, Georgia, June 2009.
Denise Wilson and Ella Kliger, "Living, Gardening, and Playing in Arsenic and Metal Contaminated Soils," Learning Laboratory, *National Environmental Health Association Conference:* Atlanta, Georgia, June 2009.
Denise Wilson and Ryan Campbell, "Filling in the Gaps: The Use of Affective Outcomes in Engineering & CSET Education Research," Frontiers in Education 2009: San Antonio, Texas.
Affective Outcomes in Engineering Education, Research Seminar, Stanford University, February 2010.
Affective Outcomes in Engineering Education, Research Seminar, Purdue University, October 2009.

Professional Activities and Service

Member of the IEEE Sensors Conference Technical Committee (2010)

Board Memberships:

2007- 2009 IEEE Sensors Journal Associate Editor
2010 IEEE Sensors Conference Technical Committee

Awards, Honors, Patents:

2008 S. Sterling Munro Public Service Teaching Award, University of Washington

Publications

Peer Reviewed Papers:

Denise M. Wilson, Philip Bell, Diane Jones, David Spring, and Lisa Hansen, "Cross Sectional Study of Belonging in Engineering Education," *International Journal of Engineering Education*, in press.

Robin S. Adams, Natalie Beltzt, Llewellyn Mann, and Denise Wilson, "Exploring student differences in formulating cross-disciplinary sustainability problems," *International Journal of Engineering Education*, in press.

Vaibhav Vaidya and Denise Wilson, "SPICE Optimization of Organic FET model using charge transport elements," *IEEE Transactions on Electron Devices*," vol. 56, no. 1, pp. 38-42, 2009.

Peer Reviewed Conference Papers:

Vaibhav Vaidya, Xiahong Zhang, Bernard Kippelen, and Denise M. Wilson, "An Organic Complementary Differential Amplifier for Flexible AMOLED Applications," *Inttl Symposium Circuits and Systems*. Paris, France, 2010, in press.

Jeff Kissinger, Ryan Campbell, Aaron Lombrozo, and Denise Wilson, "The Role of Gender in Belonging and Sense of Community," *Frontiers in Education 2009*: San Antonio, Texas.

Ryan Campbell and Denise Wilson, "Integrating Humanitarian Course Modules into Undergraduate Engineering Coursework," *Frontiers in Education 2009*: San Antonio, Texas.