Sensory Systems Technical Committee Annual Report

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

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


Summary of Activities

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

Committee members are renowned experts, who are both committed to, and active within, the field. The committee membership currently stands at 59 active members. The bylaws that govern the status of active members was updated and voted during the annual meeting at ISCAS07. This bylaw has been altered to “A member is removed from the committee if he/she does not attend three consecutive annual committee meetings or does not participate in the reviewing activities for three consecutive years”. At the last annual meeting at Paris, 31 TC members were present, 2 non members, and 5 new candidate members. The SSTC welcomed the 5 new members last year (Henry Leung, Ray Yueh-Min Huang, Francisco Serra-Graells, Steve Collins, and chai Wah Wu). Thus, last year attendance was 36 of a total of 59 members, representing an attendance rate of 61%.

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

Participation in ISCAS track paper reviews:

The Sensory Systems Track received 51 submissions at ISCAS 2011. Three to six reviews were arranged for each paper. Review Committee Member (RCM) assignments were closely monitored to guarantee reviewers were fairly spread over several institutions and countries. We had a total of 16 RCMs each coordinating the review of 3 or 4 papers. This year RCMs were: Amine Bermak, Gert Cauwenberghs, Shantanu Chakrabartty, Shoushun Chen, Eugenio Cullurciello, Tobi Delbrück, Piotr Dudek, Ralph Etienne-Cummings, Alex Fisch, Roman Genov, Viktor Gruve, Giacomo Indiveri, Andrew Mason, Christoph Posch, Teresa Serrano-Gotarredona, and Milutin Stanacevic. With 5 Sensory System Sessions (4 oral, 1 posters), we had 26 accepted (51% acceptance rate) papers (20 oral and 6 posters).
The SSTC members Tobi Delbrück and Bernabe Linares-Barranco have organized for the first time in ISCAS a new “Confession Session: Learning from others’ Mistakes”. This session runs for a time equivalent to a regular oral session (100 minutes) but presents a total of 26 mini-talks. Although the call was announced to the whole ISCAS community, all of the contributions come from the SSTC members. The audience was approximately 100 persons for this session and from this response it looks like the session will be repeated in 2012 in Korea, this time organized by the Analog Signal Processing TC (chaired by Viktor Gruev), in conjunction with the SSTC.

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

**Best Paper Award:**

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

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

**3. Journal Special Issues:**

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

**4. Out Reach:**

Members of our TC serve on program committees of various conferences such as SPIE, NIPS, ICECS, ESSCIRC, Sensors, bioCAS, EMBC, ISSNIP Biosignals and Biorobotics, SBCCI, APCCAS, IEEE Consumer Electronics Conference, ACM International Conference on Computing Frontiers, Asian Symposium on Quality Electronic Design, IEEE VLSI-SOC, International Symposium on Olfaction
and Electronics Nose, IEEE Int. Mixed-Signal, Sensors, and Systems Test Workshop 2010, IEEE Int. Conf. Very Large Scale Integration 2011 and several members are active in organizing IEEE and other conferences and workshops.


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

SSTC members have given lectures in different conference:
- Plenary talk in US-Europe Workshop on Reverse Engineering of the Human Brain
- Invited Talk, International Symposium on Olfaction and Electronic Nose

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

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

6. Future Plans:
Extend visibility of TC via special issues, books, workshops, etc.

7. Committee member activities:
The activities by the various committee members are listed in Appendix B. 1 member (John Harris) is currently a IEEE CAS Distinguished Lecturer.

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

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, ebermak@ee.ust.hk
6. Gert Cauwenberghs, University of California, San Diego, gert@uscd.edu
7. Shantanu Chakrabartty, Michigan State University, shantanu@msu.edu
8. Jennifer Blain Christen, Arizona State University, jennifer1@asu.edu
9. Marc Cohen, University of Maryland, mhcohen@glue.umd.edu
10. Steve Collins, University of Oxford, steve.collins@eng.ox.ac.uk
11. Timothy Constandinou, Imperial College London, t.constandinou@ic.ac.uk
12. Eugenio Culurciello, Yale University, eugenio.culuriello@yale.edu
13. Tobi Delbruck, University of Zurich and ETH Zurich, tobi@ini.phys.ethz.ch
14. Piotr Dudek, University of Manchester, United Kingdom, p.dudek@manchester.ac.uk
15. Ralph Etienne-Cummings, Johns Hopkins University, retienne@jhu.edu
16. Wai-Chi (Winston) Fang, National Chiao Tung University, wfang@mail.nctu.edu.tw
17. Alexander Fish, ATIPS labs, fish@atips.ca
18. Roman Genov, University of Toronto, Canada, roman@eecg.toronto.edu
19. Maysam Ghovanloo, Georgia Institute of Technology, mghovan@ece.gatech.edu
20. Viktor Gruev, University of Pennsylvania, vgruev@seas.upenn.edu
21. Martin Haenggi, University of Notre Dame, mhaenggi@nd.edu
22. Philipp Hafliger, University of Oslo, Norway, hafliger_at_ifi.uio.no
23. Tara J. Hamilton, University of Queensland, tara@itee.uq.edu.au
24. John Harris, University of Florida, harris@cnel.ufl.edu
25. Paul Hasler, Georgia Institute of Technology, phasler@ece.gatech.edu
26. Arjang Hassibi, University of Texas, arjang@mail.utexas.edu
27. Timothy Horiiuchi, University of Maryland, timmer@isr.umd.edu
28. Ray Yueh-Min Huang, National Cheng-Kung University, huang@mail.ncku.edu.tw
29. Zeljko Ignjatovic, Univ of Rochester, ignjatov@ece.rochester.edu
30. Giacomo Indiveri, University of Zurich and ETH Zurich, giacomo@ini.phys.ethz.ch
31. Ce Kuen Shieh, National Cheng Kung University, shieh@ee.ncku.edu.tw
32. Tor Sverre Lande, University of Oslo, bassen@ifi.uio.no
33. Walter D. Leon-Salas, University of Missouri, leonsalasw@umkc.edu
34. Henry Leung, University of Calgary, leung@ucalgary.ca
35. Bernabe Linares-Barranco, Sevilla Microelectronics Institute, bernabe@imse-cnm.csic.es
36. Shih-Chii Liu, University of Zurich and ETH Zurich, shih@ini.phys.ethz.ch
37. Dimitrios Loizos, Univ. of California, San Diego & NetLogic Microsystems, Inc., dloizos@netlogicmicro.com
38. Franco Maloberti, University of Pavia, Italy, franco.maloberti@unipv.it
39. Andrew Mason, Michigan State University, mason@msu.edu
40. Karim Oweiss, Michigan State University, koweiss@msu.edu
41. Jonne Poikonen, University of Turku, jokapo@utu.fi
42. Christoph Posch, Austrian Institute of Technology, christoph.posch@ait.ac.at
43. Khaled Salama, Rensaleer Polytechnic Institute, khaled@ecse.rpi.edu
44. Mohamad Sawan, Polytechnique Montreal, mohamad.sawan@polymtl.ca
45. André van Schaik, Sydney University, andre@ee.usyd.edu.au
46. Francisco Serra-Graells, Barcelona Microelectronics Institute, paco.serra@imb-cnm.csic.es
47. Teresa Serrano-Gotarredona, Sevilla Microelectronics Institute, terese@imse-cnm.csic.es
48. Bertram Shi, Hong Kong University of Science and Technology, eebert@ee.ust.hk
49. Chen Shoushun, Nanyang Tech. Univ. (NTU) Singapore, eechenss@ntu.edu.sg
50. Milutin Stanacevic, SUNY, Stonybrooke, milutin@ece.sunysb.edu
51. John Tapson, Univ. of Cape Town, Jonathan.Tapson@uct.ac.za
52. Orly Yadid-Pecht, Ben-Gurion University, oyp@ee.bgu.ac.il
53. yuJie (George) Yuan, Hong Kong Univ. Science & Techn., eeyuan@ust.hk
54. Jacob Vogelstein, Johns Hopkins University, jacob.vogelstain@jhuapl.edu
55. Chai Wah Wu, IBM Research, chaiwahwu@ieee.org
56. Denise Wilson, University of Washington, denisew@u.washington.edu
57. Peter (Chung-Yu) Wu, National Chiao Tung University, cywu@alab.ee.nctu.edu.tw
58. Mona Zaghloul, George Washington University, zaghloul@gwu.edu
59. Akos Zarandy, Hungarian Academy of Sciences, zarandy@sztaki.hu
Appendix B: member activities

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

Amine Bermak (2010-2011)

IEEE Services

Professional Activities and Service

Member of the IEEE Technical Committee on Sensory Systems.
Member of the IEEE Technical Committee on Biomedical Circuits and Systems.
Member of Technical Program Committee of the IEEE European Solid-State Circuits, 2010-2011 and the IEEE Consumer Electronics Conference CEC’2007-present.

Board Memberships:

Associate Editor IEEE Transactions on Very Large Scale Integration (VLSI) Systems.
Associate Editor IEEE Transactions on Biomedical Circuits and Systems.
Associate Editor Journal of Sensors.
Associate Editor Journal of Low Power Electronics and Applications
Review Editor Frontiers in Neuromorphic Engineering
Guest Editor, Special issue on IEEE Transactions on Biomedical Circuits and Systems, Nov 2010 (special issue of the IEEE BioCAS 09 Conference).

Awards, Honors, Patents:

Co-author of the paper receiving the “Best student paper award” at the major conference: IEEE International Symposium on Circuits and systems ISCAS, Paris, France, 2010
“Wide Dynamic Range Compressive Sampling Smart CMOS Image Sensors” Invited Seminar at Yonsei University, and Chungbuk National University, Electrical and Electronic Engineering Department, Seoul, South Korea, April 2009.

Publications

Peer Reviewed Papers:

X. Zhao, F. Boussaid(*), A. Bermak, and V. G. Chigrinov, “High-resolution thin ‘guest-host’ micropolarizer arrays for visible imaging polarimetry”, Optics Express, accepted.


**Peer Reviewed Conference Papers:**


Gert Cauwenberghs (2010-2011)

IEEE Service
Program chair, ISSNIP Biosignals and Biorobotics Conference 2011, Vitoria, Brazil, Jan. 6-8, 2011.
Program chair, ISSNIP Biosignals and Biorobotics Conference 2010, Vitoria, Brazil, Jan. 4-6, 2010.

Short Courses, Plenary Sessions, Keynotes, Invited Lectures

Professional Activities and Service
Senior Editor, IEEE Journal on Emerging Topics in Circuits and Systems (JETCAS).
Senior Editor, IEEE Sensors Journal.
Associate Editor, IEEE Trans. Neural Systems and Rehabilitation Engineering (TNSRE).
Associate Editor for the new Journal "Frontiers in Neuromorphic Engineering", as part of the open access "Frontiers in Neuroscience" journal series (http://www.frontiersin.org/).

Board Memberships:
Biomedical Engineering Society (BMES); Society for Neuroscience (SfN); International Neural Network Society (INNS); American Association for the Advancement of Science (AAAS).
Technical committees, IEEE Circuits and Systems Society: Analog Signal Processing; Neural Systems and Applications; Biomedical Circuits and Systems; Sensory Systems; Cellular Neural Networks and Array Computing.

Awards, Honors, Patents:
IEEE Fellow, class of 2011, for contributions to integrated biomedical instrumentation.

Publications

Peer Reviewed Papers:


**Peer Reviewed Conference Papers:**


**Book Chapters**

**Books**

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**Shantanu Chakrabarty (2010-2011)**

**IEEE Services**

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


**Professional Activities and Service**

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

**Guest Editor :**
- IEEE Transactions of Biomedical Circuits and Systems (Special Issue on ISCAS’ 2010)
Board Memberships:
2010 – present, IEEE Trans. on BioMedical Circuits and Systems Associate Editor
2007- present, Advances in Artificial Neural Systems, Associate Editor
2010 – present, Frontiers in Neuromorphic Engineering, Review Editor

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

Awards, Honors, Patents:
U.S. National Science Foundation, CAREER Award, 2010.
Michigan State University, Teacher-Scholar Award, 2010.

Publications

Peer Reviewed Journal Papers:

Peer Reviewed Conference Papers:

Book Chapters
Books

Dr Timothy Constandinou (2010-2011)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

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


Professional Activities and Service

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

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

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

Publications Chair: IEEE BioCAS 2010 (Cyprus)

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


Board Memberships:

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

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

Publications

Peer Reviewed Papers:

Peer Reviewed Conference Papers:


Book Chapters

Books
Eugenio Culurciello (2010-2011)

IEEE Services

Short Courses

none

Plenary Sessions

none

Keynote Speakers

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

Invited Lectures

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

Professional Activities and Service

-IEEE ISCAS Special Sessions Organizer

Board Memberships:

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

Awards, Honors, Patents:

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

Publications

Peer Reviewed Papers:


**Peer Reviewed Conference Papers:**


**Book Chapters**


**Books**

none

**Tobi Delbruck (2010-2011)**

**IEEE / Other Services**

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

**Publications**

**Peer Reviewed Papers:**


**Peer Reviewed Conference Papers:**


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


**Piotr Dudek (2010-11)**

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

**Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures**
Invited talk/Tutorial on Vision Sensors with Cellular Processor Arrays at the “Telluride Neuromorphic Engineering Workshop”, Telluride, July 2010

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

**Publications**

**Peer Reviewed Papers:**


**Peer Reviewed Conference Papers:**


**Book Chapters**

Ralph Etienne-Cummings (2010-11)

Conferences or workshops

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

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

Invited Speaker: Mitre Corporation, Mclean, VA, April 2010.
Invited Speaker: CNS Conference, Boston University, Boston, MA, May 2010.

Distinguished Lecturer in 2010-2011:

DLP: U. Texas, Austin, September 2010

Editorial Service:

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

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

Journal Articles


Conference Papers


Books and Book Chapters

Awards, Honors, and Patents:

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

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


Other IEEE Service:

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

Other Professional Service:

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

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

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

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

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

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

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

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

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

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

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

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

Media and Popular Press:

Featured on CNN in “Earth’s Frontiers”

Featured in IEEE Spectrum Article on “Thinking Like a Human”

Feature in JHU Whiting School of Engineering Magazine Articles

**Alexander Fish (2010-2011)**

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

“Digital Low voltage Logic in the Era NaNoscale CMOS”, invited lecture, Tel Aviv University, March 2010.

“Low voltage Logic and SRAM design”, invited lecture, IBM, October 2010.
Professional Activities and Service
Co-chair, Circuit and System Design track, The 3rd Asia Symposium on Quality Electronic Design (ASQED), 2011
Guest co-Associate Editor, IEEE Sensors Journal, special issue on Design Methodologies for Low Power Arrays”, 2011
Special issue editor, Special Issue "Selected Topics in Low Power Design - From Circuits to Applications", Journal of Low Power Electronics and Applications, MDPI, 2011
Member of the IEEE CAS Neural Networks, Biocas and Sensors Technical Committees (2007 – present).

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

Awards, Honors, Patents:

Publications
Peer Reviewed Papers:

Peer Reviewed Conference Papers:

Maysam Ghovanloo (2010-2011)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

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

Board Memberships:

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

Publications
Peer Reviewed Papers:

Peer Reviewed Conference Papers:


**Book Chapters**

**Patents**


**Viktor Gruev (2010-2011)**

**IEEE Services**

IEEE CAS ASPTC Chair elect since May 2010 until May 2011

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

Invited speaker at UT Austin, October 2010. Talk title: “Seeing the Unseen: Polarization Imaging”.

Invited speaker at Washington University School of Medicine, October 2010. Talk title: “Low Noise Polarization Imaging”.

Invited speaker at Southern Illinois University in Edwardsville, November 2010. Talk title: “Biologically Inspired Imaging Sensors”.

**Professional Activities and Service**

**Board Memberships:**

IEEE International Symposium on Circuits and Systems

**Awards, Honors, Patents:**


**Publications**

**Peer Reviewed Papers:**


Peer Reviewed Conference Papers:

Book Chapters

Books

Philipp Häfliger (2010-2011)

IEEE Services
IEEE CAS BioCAS TC Chair since May 2010 until May 2012

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

Professional Activities and Service

Board Memberships:

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

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:
Peer Reviewed Conference Papers:

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

Book Chapters

Books

Tara Julia Hamilton (2010-2011)

IEEE Services
IEEE CAS SSTC member since May 2009

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures
Invited speaker at the Telluride Neuromorphic and Cognition Engineering Workshop 2010, June - July 2010

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

Board Memberships:

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:


Peer Reviewed Conference Papers:

B. Thanigaivelan, D. Ball, J. Wiles, T.J. Hamilton “An 8-Channel Neural Recording System with Programmable Gain and Bandwidth”, Asia Pacific Signal and Information Processing Association (APSIPA) Annual Summit and Conference (ASC) Student Poster Symposium Singapore December 2010
S. Mann, T.J. Hamilton “A Neuron Optimized for FPGA Implementation”, Asia Pacific Signal and Information Processing Association (APSIPA) Annual Summit and Conference (ASC) Student Poster Symposium Singapore December 2010

**Book Chapters**

**Books**

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**Giacomo Indiveri (2010-2011)**

**IEEE Services**

**Short courses, Plenary Sessions, Keynote Speakers, Invited Lectures**
ISCAS 2010 tutorial: Analog/digital and hybrid bio-silicon circuits for hardware neurons, synapses, and spiking neural networks (together with Sylvie Renaud)

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

**Board Memberships**
Board of directors: Telluride Neuromorphic Cognition Engineering Workshop

**Publications**

Bernabé Linares-Barranco (2010-2011)

IEEE Services
IEEE CAS SSTC Chair since May 2009 until May 2011
IEEE Chair of CAS Spanish Chapter

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

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

Board Memberships:
IEEE International Symposium on Circuits and Systems, Special Session Co-organizer “Confession Session”, (ISCAS 2011)

Awards, Honors, Patents:
IEEE Fellow since January 2010

Publications

Peer Reviewed Papers:


Peer Reviewed Conference Papers:


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

Real-Time Processing,” Proceedings of the 2010 20th International Conference on Pattern Recognition (ICPR), 2010, Page(s): 3085
– 3088.

Book Chapters

Books

Shih-Chii Liu (2010-2011)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures
“Artificial spike-based audition”, invited for 2nd Global COE Intl Symp Electronic Devices Innovation, EDIS 2009 - Series

Professional Activities and Service
Track Co-Chair of the 2011 ISCAS Neural Systems and Networks Track
Member of the IEEE CAS Sensory Systems and Neural Systems and Applications Technical Committees
Chair of IEEE Swiss CAS/ED Chapter

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

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:
Y-X Wang, S-C. Liu, “A two-dimensional configurable active silicon dendritic neuron array”, IEEE Transactions on Circuits and
Systems, 2011.
Y-X Wang, S-C. Liu, “Multilayer processing of spatiotemporal spike patterns in a neuron with active dendrites”, Neural Computation,
P. D’Souza, S-C. Liu, R. Hahnloser,“The perceptron learning rule derived from spike-frequency adaptation and spike-time-dependent

Peer Reviewed Conference Papers:
S-C. Liu, A. van Schaik, B. Minch, T. Delbruck, “Event-based 64-channel binaural silicon cochlea with Q enhancement
H. Finger, P. Ruvolo, S-C. Liu, J. Movellan, “Approaches and databases for online calibration of binaural sound localization for robotic
Y-X Wang, S-C. Liu, “Motion detection using an aVLSI network of spiking neurons”, IEEE International Symposium on Circuits and
S. Chakrabartty, S-C. Liu, “Exploiting spike-based dynamics in a silicon cochlea for speaker identification”, IEEE International

**Book Chapters**

**Books**

**Andrew Mason, 2010-2011**

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


**Professional Activities & IEEE Services**

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

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


Special Sessions Co-Chair, IEEE BioCAS Conference 2010


**Awards, Honors**

2010 Withrow Award for Teaching Excellence (Michigan State University)

Best Student Paper, IEEE BioCAS Conference 2010

**Peer Reviewed Conferences Publications**


INVITED LECTURES & SEMINARS

INSPIRE 2010 (Plenary): International Conference on information representation and estimation, University College London, London, UK, September 8th, 2010
Institute of Neuroscience, University of Newcastle, UK, September 9th, 2010
Workshop on Methods of Information Theory in Computational Neuroscience, 19th annual Computational Neuroscience, San Antonio, TX, USA, July 30th, 2010
Workshop on Beyond Brain Machine Interfaces: From Senses to Cognition, Neural Interfaces Conference, Long Beach, CA, USA, June 19th, 2010
2nd International Conference on Neuroprosthetic Devices (ICNPD), Beijing, China, February 27-28, 2010
Department of Neurology seminar series, University of Georgia, USA, February 23rd, 2010

PROFESSIONAL ACTIVITIES

Senior Member, Institute of Electrical and Electronics Engineers (IEEE)
Invited Session, Workshop and Track Chairing
2010  32nd IEEE Engineering in Medicine & Biology Conference: “Analysis of Neural Signals” Track Chair, “Estimation of Brain Connectivity” Session Chair, “Brain Stimulation” Session Chair
2010  4th International meeting on Brain Computer Interface: “Using BCI Systems to Induce Neural Plasticity and Restore Function” Workshop leader

PUBLICATIONS

Books & Dissertations

Peer-Reviewed Book Chapters

Editorials

Peer-Reviewed Journal Publications

**International Peer-reviewed Conference Papers**

(i) Full publication review

J. Liu, K. Oweiss, H. Khalil, “Feedback Control of the Spatiotemporal Firing Patterns of Neural Microcircuits,” in Proc. of 49th IEEE Conference on Decision and Control (CDC), 2010
S. Eldawlatly and K. Oweiss, “Causal Networks Provide Functional Signature of Stimulus Encoding in the Rat Barrel Cortex”, in Proc. 31st IEEE Eng. in Medicine and Biology (EMBC), 2010

(ii) Abstracts & Abstract-reviewed papers

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

**Christoph Posch (2010-2011)**

**IEEE Services**

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

**Professional Activities and Service**

Review Editor "Frontiers in Neuromorphic Engineering" Journal

**Board Memberships:**

Review Committee (RC) Member - IEEE International Symposium on Circuits and Systems (ISCAS 2011)
Technical Program Committee (TPC) Member - Asia Pacific Conference on Circuits and Systems (APCCAS 2010)
Awards, Honors, Patents:
AT 502.551 (A1) VERFAHREN UND BILDAUSWERTUNGSEINHEIT ZUR SZEENENANALYSE (METHOD AND IMAGE EVALUATION UNIT FOR SCENE ANALYSIS), granted, November 15, 2010.

Publications

Peer Reviewed Papers:

Peer Reviewed Conference Papers:

Book Chapters

Books

**Francisco Serra-Graells (2010-2011)**

IEEE Services

Reviewer
IEEE TCAS-I, IEEE TCAS-I, IET EL
Publications

Peer Reviewed Papers

**Teresa Serrano-Gotarredona (2010-2011)**

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

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

Publications

Peer Reviewed Papers:

**Peer Reviewed Conference Papers:**


**Book Chapters**

**Books**

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**Shoushun Chen (2010-2011)**

**Professional Activities and Service**

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

**Editorial Board:**
2011- Associate Editor for Sensors Journal

**Reviewer:**

**Publications**

**Journal papers**

**Conference papers**
Xiao-Liang Tan, Anh Tuan Do, Shoushun Chen, Kiat Seng Yeo and Zhi-Hui Kong, "A New Match Line Sensing Technique in Content Addressable Memory," accepted at International Symposium on low-power and high-speed chips (cool chip XIV) Yokohama Japan, April 20-22, 2011.
Bo Zhao and Shoushun Chen, "Realtime Feature Extraction Based on MAX-like Convolutional Network for Human Activity Recognition," accepted at the 2011 IEEE International Symposium on Circuits and Systems (ISCAS), Rio de Janeiro, Brazil.
Milutin Stanacevic (2010-2011)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

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

Publications

Peer Reviewed Papers:

Peer Reviewed Conference Papers:

Chai Wah Wu (2010-2011)

IEEE Services

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures

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

Board Memberships:
Guest Associate Editor, International Journal of Bifurcation and Chaos
Associate Editor, IEICE NOLTA
Guest Editor, Special Issue on Synchronization, IEICE
Awards, Honors, Patents:

Publications

**Peer Reviewed Papers:**

**Peer Reviewed Conference Papers:**

**Book Chapters**

**Books**

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**Orly Yadid-Pecht (2010-2011)**

**IEEE Services**

**Invited Lectures**

**Other professional activities**
Guest Editor, IEEE Sensors Journal Special Issue on Low Power Arrays 2010-2011
Associate Editor, IEEE Transactions on Biomedical Circuits and Systems 2010-2011
Associate Editor, Journal of Low Power Electronic Applications (JLPEA) of Elsevier 2010-2011
Associate Editor, IEEE Technology News (ITN) 2010-2011
Member of the IEEE CAS Neural Networks, Biocas and Sensors Technical Committees (1996 – present).
Member of the SPIE Solid State Sensor Arrays international conference program committee (1997-present).
Member of the Technical Committee for the IEEE BioCAS conference (2004-present).
Member of the Steering Committee for the IEEE ICECS (2003-present).
Member of the IEEE CAS Women in Engineering Committee.

**Board Memberships:**
Board Member, IEEE Sensors Council 2010

**Awards and Honors**
2010 RC Strategic Grant
Publications

Peer Reviewed Papers:

Peer Reviewed Conference Papers:

Jie Yuan (2010-2011)

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

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures
Invited speaker at the CMOS Emerging Technologies Workshop, Whistler, Canada, 2010. Talk title: “Wide dynamic range CMOS imaging sensor for bio-medical imaging”.
Invited Speaker at International Conference of Sampling Theory and Applications (SAMPTA), Singapore, 2-6 May 2011,. Talk title: “A 12-bit 20MS/s 56.3mW pipelined ADC with interpolation-based nonlinear calibration”. 
Professional Activities and Service

TPC members, IEEE International Conference on VLSI and System-on-chip, 2010/2011

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

Awards, Honors, Patents:

Publications

Peer Reviewed Papers:

Peer Reviewed Conference Papers:
B. Liu, and J. Yuan, “A highly linear monolithic CMOS detector for computed tomography”, 2011 International Symposium on VLSI Design, Automation & Test (VLSI-DAT), Hsinchu, Taiwan, accepted
J. Yuan, “Wide dynamic range CMOS imaging sensor for bio-medical imaging”, CMOS Emerging Technologies, Whistler, Canada, 2010

Book Chapters

Books

Mona Zaghloul (2010-2011)

IEEE Services

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

Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures:
Distinguished Lecturer in 2010-2011:
Editorial Service:

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

Awards, Honors, and Patents:

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

Journal Articles

Conference Papers


Books and Book Chapters