ANNUAL REPORT 2009 - NSA TC, IEEE CAS SOCIETY

Past-Chair: Giacomo Indiveri
Chair: Wei Xing Zheng
Chair-Elect: Shih-Chii Liu
Secretary: Pamela Abshire
Secretary-Elect: John Harris

(1) TC Meeting: The last TC meeting was held on May 19, 2008 during the 2008 IEEE International Symposium on Circuits and Systems, Seattle, Washington, USA, May 18-21, 2008.

(2) Conferences or workshops where the NSA TC or members of the TC were actively involved in 2008-2009 include the following:

- Technical Session Chair, Conference on Information Sciences and Systems 2009, Baltimore, MD, March 18-20, 2009 (Pamela Abshire)
- Co-Chair, National Science Foundation CISE REU Sites PI Meeting, March 2009 (Pamela Abshire)
- Program Co-Chair, ICCIT’2008, November 2008, Bousan, Korea (Majid Ahmadi)
- Technical Program Committee, IEEE Biomedical Circuits and Systems 2008; 20th Symposium on Integrated Circuits and Systems Design 2008 (Shantanu Chakrabartty)
- Technical Review Committee, IEEE ISCAS 2008 (Shantanu Chakrabartty)
- Tutorials Chair, IEEE Biomedical Circuits and Systems 2008 (Eugenio Culurciello)
- Co-Track Chair, IEEE Biomedical Circuits and Systems 2008 (Shih-Chii Liu)
- Co-Organizer of 2008 Telluride Neuromorphic Engineering Workshop (Tobi Delbruck)
- Special Session Co-Organizer, Advanced Neural Microsystems, IEEE ISCAS 2008 (with Dr. P. Mohseni) (Maysam Ghovanloo)
- Technical Program Committee, IEEE Biomedical Circuits and Systems Conference (BioCAS’08), Baltimore, MD, November 2008 (Maysam Ghovanloo)
- Co-Chair, Sensory Systems Track, IEEE ISCAS 2008 (Shih-Chii Liu)
- Organizer, Special Session on Live Demonstrations of Circuits and Systems, IEEE ISCAS 2008 (P. Häfliger)
- Technical Program Committee, IEEE Biomedical Circuits and Systems Conference 2008 (P. Häfliger)
- Chair, 2008 Neural Information Processing Systems Demo Track (Giacomo Indiveri)
- Advisory Board member, Telluride Neuromorphic Cognition Engineering Workshop (Giacomo Indiveri)
- International Program Committee, North America Technology Conference, McGill University, Montreal, Canada, August 13-15, 2008. (H. K. Kwan)
Co-Chair, Signal Processing and Communications Track, International Conference on Communications, Circuits and Systems, Xiamen, China, May 25-27, 2008 (H. K. Kwan)

Co-Chair, Technical Program Committee, 2008 International Conference on Computer, Communications, Circuits and Systems. (May 25-27, 2008, Xiamen, China) (Bin-Da Liu)

Special and Invited Session Chair, the 2008 IEEE International Conference on Neural Networks and Signal Processing. (June 7-11, 2008, Nanjing, China) (Bin-Da Liu)


Co-Chair of International Advisory Committee, the 2008 IEEE Asia-Pacific Conference on Circuits and Systems. (November 30-December 3, Macao, China) (Bin-Da Liu)

Co-Chair of Technical Program Committee, the 2009 IEEE Circuits and Systems International Conference on Testing and Diagnosis. (April 28-29, 2009, Chengdu, China); 2009 IEEE International Symposium on Circuits and Systems. (May 24-27, 2009, Taipei, Taiwan) (Bin-Da Liu)

International Committee Member, Brain Inspired Cognitive Systems Conference (Shih-Chii Liu)

Technical Program Committee, First International Conference on Complex Sciences: Theory and Applications (Complex’2009), February 23-25, 2009, Shanghai, P. R. China; 2009 IEEE International Joint Conference on Computational Sciences and Optimization (IEEE CSO 2009), April 24-26, 2009, Sanya, Hainan Island, P. R. China; 2008 International Workshop on Chaos-Fractals Theories and Applications, Nov. 18-21, 2008, Zhangjiagai, Hunan Province, P. R. China; International Joint Conference on Neural Networks (IJCNN 2008) and IEEE World Congress on Computational Intelligence (WCCI 2008), Jun. 1-6, 2008, Hong Kong (Jinhu Lu)

International Program Committee, 2009 IEEE International Conference on Networking, Sensing and Control (ICNSC2009), March 26-29, 2009, Okayama, Japan (Jinhu Lu)

Co-Chairman of Organizing Committee, The 4th Chinese Conference on Complex Networks (CCCN'08), Oct. 10-13, 2008, Beijing, P. R. China (Jinhu Lu)

Track Chair of Theory, Design and Implementation of Circuits and Systems, International Conference on Communications, Circuits and Systems 2008 (ICCCAS'08), May 25-27, 2008, Xiamen, Fujian Province, P. R. China (Jinhu Lu)

Organizing Committee, 2008 IEEE International Conference on Information and Automation (ICIA), Jun. 20-23, 2008, Zhang Jia Jie, Hunan Province, P. R. China (Jinhu Lu)

Technical Program Committee Member and Associate Editor, The 27th Chinese Control Conference, Jul. 16-18, 2008, Kunming, Yunnan Province, P. R. China (Jinhu Lu)

Program Committee, IEEE Symposium on Computational Intelligence for Multimedia Signal and Vision Processing (CIMSVP) 2009; IEEE International Workshop on Cellular Neural Networks and their Applications (CNNA) 2008 (Bert Shi)

Track Chair, Neural Systems, Asia Pacific Conference on Circuits and Systems (APCCAS) 2008 (Bert Shi)

Technical Committee, SPIE Intl. Symp. on Microtechnologies for the New Millenium: Bioengineered and Bioinspired Systems 2009; International Joint Conference on Neural Networks 2008, 2009 (Bert Shi)

Organizer, Special Session on Revolutionizing Prosthetics, 2008 IEEE Biomedical Circuits and Systems Conference (R. J. Vogelstein)

Session Co-Chair, Neural Systems & Applications poster session, 2008 IEEE ISCAS (R. J. Vogelstein)


Technical Program Committee, 5th International Workshop on Signal Processing and its Applications (WoSPA’2008), Sharjah, United Arab Emirates (U.A.E.), March 2008; 2008 IEEE World Congress on Computational Intelligence (WCCI’2008), Hong Kong, June 2008; 2008 Chinese Control and Decision Conference (CCDC’2008), Yantai, Shandong, China, July 2008 (Wei Xing Zheng)

International Program Committee, 2008 IEEE International Conference on Networking, Sensing and Control (ICNSC’2008), Sanya, Hainan, China, April 2008; 7th World Congress on Intelligent Control and Automation
(3) **Ongoing conferences or workshops where the NSA TC or members of the TC are actively involved in 2008-2009 include the following:**

- Steering Committee, NSF CISE REU Sites PI Meeting, 2008-2010 (Pamela Abshire).
- Treasurer, International Semiconductor Device Research Symposium 2009 (Pamela Abshire)
- Program Co-Chair, ICCITT’2009, November, 2009, Bousan, Korea (Majid Ahmadi)
- Track Chair, DSP and Digital VLSI, 2009 European Conference on Circuit Theory and Design, August 2009, Antalya, Turkey. (Majid Ahmadi)
- Technical Program Committee, IEEE-NEWCAS’2009, Toulouse France; ICECS’2009, Tunisia (Majid Ahmadi)
- Technical Review Committee – IEEE ISCAS 2009 (Shantanu Chakrabarty)
- Review Committee – Neural Information Processing Systems Conference 2008 (Shih-Chii Liu)
- Invited Lecturer – 2008 Telluride Neuromorphic Engineering Workshop (Shih-Chii Liu)
- Invited talk chair, IEEE Circuits and System for Medical and Environmental Applications Workshop 2009 (Eugenio Culurciello)
- Co-organizer of 2009 Telluride Neuromorphic Engineering Workshop (Tobi Delbruck)
- Co-organizer of Dynamic Vision Forum, Zurich, 60 attendees to one day event with 4 live demonstrations (Tobi Delbruck)
- Secretary IEEE CAS SSTC (Tobi Delbruck)
- Technical Review Committee, IEEE Engineering in Medicine and Biology Conference (EMBC’09), Minneapolis, MN, September 2009 (Maysam Ghovanloo)
- Track co-chair, Live Demonstrations of Circuits and Systems IEEE ISCAS 2009, (P. Häfliger)
- Organizer of the 2009 CapoCaccia Workshop toward Cognitive Neuromorphic Engineering (Giacomo Indiveri)
- Advisory Board member, Telluride Neuromorphic Cognition Engineering Workshop (Giacomo Indiveri)
- Chair, Intelligent Systems and Applications Track, Annual Summit and Conference, Asia Pacific Signal and Information Processing Association, Sapporo, Japan, Oct. 4-7, 2009. (H. K. Kwan)
- Co-chair, Signal Processing Track, International Conference on Communications, Circuits and Systems, San Jose, California, USA, July 23-25, 2009 (H. K. Kwan)
- Technical Program Committee, 2010 IFAC Conference on Management and Control of Production and Logistics, September 8-10, 2010, University of Coimbra, Portugal; Nonlinear Circuits and Systems Symposium (NCASS) under the 7th International Conference on Communication, Circuits and Systems (ICCCAS 2009), July 23-25, 2009, San Jose, California, USA; 2009 IEEE International Conference on Service Operations, Logistics and Informatics, Jul 22 - 24, 2009, Chicago, IL, USA; Sixth International Symposium on Neural Networks (ISNN 2009), May 26-29, 2009, Wuhan, P. R. China (Jinhu Lu)
- Chair of Special Session, Complex Networks: Analysis, Control and Applications and Review Committee Member, IEEE ISCAS 2009, May 24-27, 2009, Taipei (Jinhu Lu)
- International Scientific Committee, the 3rd International Conference on Complex Systems and Applications (ICCSA 2009), Jun 29 - Jul 2, 2009, Le Havre, Normandy, France (Jinhu Lu)
- International Program Committee, International Conference on Neural Computation (ICNC 2009), Oct 5-8, 2009, Madeira, Portugal (Jinhu Lu)
- Academic Committee, the 12th Conference on Nonlinear Oscillation and the 8th Chinese Nonlinear Dynamics and Stability of Motion, May, 2009, Zhenjiang, Jiangsu Province, P. R. China (Jinhu Lu)
- Co-Chair of Technical Program Committee, the 7th International Conference on Computer, Communications, Circuits and Systems. (July 23-25, 2009, San Jose, CA, USA) (Bin-Da Liu)
- Technical Program Committee, the 2008 IEEE International Conference on Systems, Man, and Cybernetics. (October 11-14, 2009, San Antonio, TX, USA) (Bin-Da Liu)
- International Advisor, the First Asia Pacific Conference on Postgraduate Research in Microelectronics & Electronics (PrimeAsia2009), (November 18-20, 2009, Shanghai, China) (Bin-Da Liu)
- Technical Committee, International Joint Conference on Neural Networks 2008, 2009 (Bert Shi)
- Publicity Chair, IEEE International Workshop on Cellular Neural Networks and their Applications (CNNA) 2010 (Bert Shi)
- Track Chair, Neural Systems and Applications, Technical Program Committee of the 2009 IEEE International Symposium on Circuits and Systems (ISCAS'2009), Taipei, Taiwan, May 2009 (Wei Xing Zheng)
- International Program Committee, 2009 IEEE International Conference on Networking, Sensing and Control (ICNCS'2009), Okayama City, Japan, March 2009; 15th IFAC Symposium on System Identification (SYSID'2009), Saint-Malo, France, July 2009; 7th Asian Control Conference (ASCC’2009), Hong Kong, August 2009 (Wei Xing Zheng)
- Technical Program Committee, 2009 Chinese Control and Decision Conference (CCDC’2009), Guilin, Guangxi, China, June 2009; 48th IEEE Conference on Decision and Control (CDC’2009), Shanghai, China, December 2009 (Wei Xing Zheng)
- Asia/Pacific Liaison of the 2009 IEEE/INFORMS International Conference on Service Operations, Logistics and Informatics (SOLI'2009), Chicago, Illinois, USA, July 2009 (Wei Xing Zheng)
- Publicity Co-Chair, 2009 IEEE International Conference on Automation and Logistics (ICAL'2009), Shenyang, China, August 2009 (Wei Xing Zheng)
- Invited Sessions Co-Chair, 7th International Conference on Control and Automation (ICCA'2009), Christchurch, New Zealand, December 2009 (Wei Xing Zheng)

(4) Short Courses, Plenary Sessions, Keynote Speakers, Invited Lectures:
- Invited lecture, 2nd Annual Intelligence Community Academic Summit, College Park, MD, June 23-26, 2008 (Pamela Abshire)
- Invited lecture, NCMR Spring Technical Review, Santa Fe, NM, March 31-April 4, 2008 (Pamela Abshire)
- Invited lecture, Operating below the sub-microwatt barrier – Explorations in Analog Computing, Wireless Integrated Microsystems (WIMS), University of Michigan, Ann Arbor, April 2009 (Shantanu Chakrabartty)
- Invited lecture, CMOS Circuits for Biomechanical Implants, CMOS Emerging Technologies Workshop, Vancouver, August 2008 (Shantanu Chakrabartty)
- Invited lecture, Sub-microwatt Sensors for Structural Health Monitoring of Biomechanical Implants, University of California, San Diego, August 2008 (Shantanu Chakrabartty)
- Invited lecture, Towards Reliable Multi-pathogen Biosensors using High-dimensional Encoding and Decoding Techniques, SPIE Symposium on NanoScience+Engineering, CA 2008 (Shantanu Chakrabartty)
- Invited lecture, High-dimensional Encoding-Decoding Techniques for Reliable Pathogen Detection, Hunter College, City University of New York, Feb 2008 (Shantanu Chakrabartty)
- Invited lecture, Mixed-signal data mining on microphone array hearing aids, Radio-Frequency Integrated Circuits Symposium, Atlanta Georgia, July, 2008 (Shantanu Chakrabartty)
- Invited lecture, Yonsei University, Seoul S. Korea, December 5th 2008, host: Prof. Gunhee Han (Eugenio Culurciello)
- Invited lecture, KAIST (Korean Advanced Institute of Science and Technology), Daejon S. Korea, December 9th 2008, host: Prof. Hoi-Jun Yoo (Eugenio Culurciello)
- Invited lecture, Silicon-on-sapphire: mixed-signal circuits and micro-systems design and opportunities, Columbia University, October 31st 2008. Host: Prof. Yannis Tsvividis (Eugenio Culurciello)
- IEEE CAS Society Distinguished Lecture, *Dynamic silicon retina for event-based digital vision*, Electrical and Computer Engineering Seminar Series, University of Florida, 31.01.08 (Tobi Delbruck)
- IEEE CAS Society Distinguished Lecture, *Spike-based silicon vision*, Secure Life Symposium, Univ. of Tokyo, 06.03.08 (Tobi Delbruck)
- IEEE CAS Society Distinguished Lecture, *Dynamic digital vision with events*, Tetsua YAGI Lab, Osaka University, 10.03.08 (Tobi Delbruck)
- Invited lecture, *Spiking silicon retina for dynamic digital vision*, Carl-von-Ossietzky-Universität Oldenburg, 29.05.08 (Tobi Delbruck)
- Invited lecture, *Dynamic vision with spike-based silicon retinas*, BCCN Munich (Bernstein Center for Computational Neuroscience Munich), 02.06.08 (Tobi Delbruck)
- IEEE CAS Society Distinguished Lecture, *Building high performance neuromorphic and bioinspired systems*, Simon Fraser University, Burnaby, 28.07.08 (Tobi Delbruck)
- Invited lecture, *Spike based digital vision*, Autonomous Systems Lab (ASL), 21.08.08 (Tobi Delbruck)
- Invited lecture, *Spike based digital vision*, Sensors and Sensing in Biology and Engineering, 16.10.08 (Tobi Delbruck)
- Invited lecture, *Novel technologies for improving the quality of life for people with severe disabilities*, School of Computer Science, Florida International University, Miami, FL, Mar. 2009 (Maysam Ghovanloo)
- Invited lecture, *Novel technologies for improving the quality of life for people with severe disabilities*, Department of Electrical and Computer Engineering, Old Dominion University, Norfolk, VA, Nov. 2008 (Maysam Ghovanloo)
- Invited lecture, *Electronic Implants*, That's IT, 150 years anniversary of the 'Realist Foreningen' and 40 years anniversary of the 'Cybernetisk Selskap' at the University of Oslo (P. Häfliger)
- Invited lecture, *Neural Computation and Synaptic Plasticity Using Neuromorphic VLSI*, Institute of Informatics, University of Zurich, Switzerland, 2008 (Giacomo Indiveri)
- Invited lecture, *An overview of neuromorphic circuit research at INI*, BIES08 Workshop, Edinburgh, UK, 2008 (Giacomo Indiveri)
- Invited lecture, *Neuromorphic computation and plasticity in VLSI*, Italian Institute of Technology, Genoa, Italy, 2008 (Giacomo Indiveri)
- Invited lectures, 4 invited research seminars at four universities in Hong Kong. (H. K. Kwan)
- Invited lecture, The International Workshop on Complex Engineering Systems and Design, Hong Kong, May 22, 2009 (Jinhu Lu)
- Invited lecture, The International Workshop on Complex Systems and Networks, Canberra, Australia, October 1-3, 2008 (Jinhu Lu)
- Keynote Speech, *How to contribute further at professional societies such as IEEE?*, Annual Meeting of Taiwan Section, Taiwan, Dec. 2008 (Bing Sheu)
- Invited lecture, *Talents Nurturing at 21st Century to Enhance Global Competitiveness*, National Chiao Tung University, Feb. 2009 (Bing Sheu)

(5) **Distinguished Lecturer in 2008-2009:**
- Tobi Delbruck, IEEE CAS DLP: Lectured in Florida, Tokyo, Osaka, Burnaby Canada
- Bert Shi, IEEE CAS DLP: Lectured in Dresden, Germany, and Budapest, Hungary
(6) Editorial Service:

- Regional Editor, Journal of Circuits, Systems and Computers (Majid Ahmadi)
- Associate Editor, Pattern Recognition Journal (Majid Ahmadi)
- Associate Editor, Advances in artificial neural systems, Hindawi Publications (Shantanu Chakrabartty)
- Associate Editor, IEEE TBioCAS and PloS ONE Synthetic Vision Systems (Eugenio Culurciello)
- Associate Editor, IEEE TBioCAS (Tobi Delbruck)
- Associate Editor, IEEE TCAS II (Maysam Ghovanloo)
- Associate Editor, IEEE TNN, Cognitive Computation (Springer), Advances in Artificial Neural Systems (Hindawi) (Giacomo Indiveri)
- Review Editor, Frontiers in Neuro-engineering (Giacomo Indiveri)
- Editorial Board, The Neuromorphic Engineering newsletter (Giacomo Indiveri)
- Reviewer: IEEE TCAS II, IEEE TNN, IEEE TBME, NIPS, ISCAS (Giacomo Indiveri)
- Associate Editor, IEEE TCAS II, Dynamics of Continuous, Discrete and Impulsive Systems Series A, Journal of Systems Science and Complexity (Jinhu Lu)
- Editorial Board, ARI - The Bulletin of the Istanbul Technical University (Jinhu Lu)
- Editorial Board, The International Journal of Cognitive Informatics and Natural Intelligence (Jinhu Lu)
- Review editor, Frontiers in Neuro robotics (R. J. Vogelstein)
- Co-Editor of Special Issue of IEEE Transactions on Biomedical Systems, 2009 (Shih-Chii Liu)
- Editorial Board, Proceedings of the IEEE, 2008 – 2010 (Bing Sheu)
- Associate Editor, IEEE TCAS II, IEEE Signal Processing Letters (Wei Xing Zheng)
- Guest Associate Editor, Special Issue on Blind Signal Processing and Its Applications, IEEE TCAS I (Wei Xing Zheng)

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

(a) Journal Articles


A. Mirzaei, M. Rahmati, and M. Ahmadi, A New Method for Hierarchical Clustering Combination, *Intelligent Data Analysis*, vol. 12, no. 6, pp. 549-571, 2008.


(b) Conference Papers


• R. Berner, P. Lichtsteiner, and T. Delbruck, Self-timed vertacolor dichromatic vision sensor for low power face detection, *IEEE ISCAS 2008*.


• Z. Fu, E. Culurciello, P. Lichtsteiner, and T. Delbruck, Fall detection using an address-event temporal contrast vision sensor, *IEEE ISCAS 2008*.


W. Bishop, R. Armiger, J. Burck, M. Bridges, M. Hauschild, K. Englheart, E. Scheme, R. J. Vogelstein, J. Beaty, and S. Harshbarger, A real-time virtual integration environment for the design and development of


(c) Books and Book Chapters

- E. Culurciello, Silicon-on-Sapphire, SOI circuits and systems, McGraw Hill publishing company, Fall 2009.

(8) Awards, Honors, and Patents:

- University of Windsor Faculty of Engineering Dean’s Special Recognition Award, 2008 (Majid Ahmadi)
- Best Paper Award, Neural Systems and Applications Track, IEEE Circuit and System Society, for the IEEE ISCAS 2008 paper “Fall detection using an address-event temporal contrast vision sensor” (Eugenio Culurciello, Tobi Delbruck)
- Second Prize, 2008 National Natural Science Award of China (The First Prize is vacant in 2008), Chaos Anti-Control and the Generalized Lorenz Systems Family: Theory and Applications (Jinhu Lu)
- Patent: A scroll chaotic signal generator and its using method (Jinhu Lu)
- Patent: A four-order grid multi-torus chaotic circuit and its using method (Jinhu Lu)
- Paper Award, 2008 Conference on Innovative Applications of Systems Prototyping and Circuit Design, Taichung, Taiwan (Bin-Da Liu)
- Honorary Co-Chair, 2009 ISCAS (Bing Sheu)
- Honorary Chair Professor, National Chiao Tung University (Bing Sheu)
- Laurence Hafstad Fellow, Johns Hopkins University Applied Physics Lab (R. J. Vogelstein)
- Invention of the Year Nominee, Johns Hopkins University Applied Physics Lab (R. J. Vogelstein)
- Special Achievement Award, Johns Hopkins University Applied Physics Lab (R. J. Vogelstein)
- Merit Award, Johns Hopkins University Applied Physics Lab (R. J. Vogelstein)

(9) Other IEEE Service:

- Member, IEEE CAS Society Fellow Committee 2009 (Majid Ahmadi)
- Secretary, IEEE CAS SSTC (Tobi Delbruck)
- Chair, IEEE CAS SSTC (Shih-Chii Liu)
- Technical Committee Member, IEEE CAS Sensory Systems (P. Häfliger)
- Secretary, IEEE CAS Biomedical Circuits and Systems Technical Committee (P. Häfliger)
- Technical Committee Member, IEEE CAS Biomedical Circuits and Systems, IEEE CAS Sensory Systems (Giacomo Indiveri)
- Member, IEEE CAS Society Fellow Committee 2009 (Bert Shi)
- IEEE CAS Society Representative to the IEEE Systems Council, 2007-2008 (Bert Shi)
- Technical Committee Member, IEEE CAS Sensory Systems (R. J. Vogelstein)
- Web Administrator, IEEE CAS Society Technical Committee on Digital Signal Processing (Wei Xing Zheng)
- International Steering Committee of the IEEE Asia Pacific Conference on Circuits and Systems (Wei Xing Zheng)

(10) Other Professional Service:
Panelist, National Science Foundation (Pamela Abshire)
Panelist, National Science Foundation (Shantanu Chakrabartty)
Executive Board of the Institute of Neuromorphic Engineering, 2002-Present (Giacomo Indiveri)
Advisory Committee, Italian Society of Neural Networks SIREN (Giacomo Indiveri)
Scientific Advisory Board, Information Technologies Division of Austria Research Centers (ARC) (Giacomo Indiveri)
Chair, Intelligent Systems and Applications Technical Committee, Asia Pacific Signal and Information Processing Association. (H. K. Kwan)
Co-Organizer with Peter Wu, *IEEE Fellows promotion: Strategy and Practice*, National Chiao Tung University, Jan. 2009 (Bing Sheu)
Project Leader, *Talents & Infrastructure*, National SoC Program Office, Taiwan (Bing Sheu)