2010 Annual report of IEEE CAS CNNAC TC

Name Change: the name of the technical committee was changed to Cellular Nanoscale Networks and Array Computing.

Activities of TC members during June 2009-May 2010:

Books:

1. C. Baatar, W. Porod and T. Roska,, Editors, Cellular Nanoscale Sensory Wave Computing, Springer, 2010

Book chapters:

2. E. Gomez-Ramirez, E. H. Sedeno and G. E. Pazienza, Discovering universal polynomial cellular neural networks through genetic algorithms., in Bio-inspired hybrid intelligent systems for image analysis and pattern recognition. (Studies in computational intelligence 256.), Springer, 2009.
3. Ricardo Carmona, Cellular Nanoscale Sensory Wave Computing, Springer, 2010

Journal articles:

1. L. O. Chua and G. E. Pazienza, "Nonlinear Dynamics Perspective of Wolfram's New Kind of Science, Part XII: Period-3 and Period-6 rules", International Journal of Bifurcation and Chaos, Vol.12 No.19, 2009.
2. L. O. Chua, G. E. Pazienza, and J. Shin, "Nonlinear Dynamics Perspective of Wolfram's New Kind of Science, Part XI: Period-1 rules", International Journal of Bifurcation and Chaos, Vol.19 No.5, pag. 1425-1654, 2009.
3. L. O. Chua, G. E. Pazienza, and J. Shin, "Nonlinear Dynamics Perspective of Wolfram's New Kind of Science, Part X: Period-1 rules", International Journal of Bifurcation and Chaos, Vol.19 No.6, pag. 1751-1930, 2009.
4. B. Sheu, P.-H. Chen, "Revealing IEEE Fellows Unknown" NTU EE Alumni Newsletters, vol. 32 & 33 (Part 1 & Part 2), 2009.
5. B. Sheu, L.-G. Chen, W.-Z. Chen, C. Y. Wu, "Sharing 2009 Experiences on Innovative Mentoring in SoC field in Taiwan," IEEE Circuits and Systems Society e-Newsletters, vol. 3, no. 5, Oct. 2009.
6. D. Verma, C. W. Wu, T. Brown, A. Bar-Noy, S. Shamoun, M. Nixon, "Application of halftoning algorithms to location dependent sensor placement," Proceedings of IEEE International Symposium on Circuits and Systems (ISCAS), 2009.
7. L. Chism, X. He, L. Huang, A. Ibrahim, C. Jones, Y. Shu, C. W. Wu, Z. Fu, "Performance study of peer-to-peer video streaming on complex networks," Proceedings of IEEE International Symposium on Circuits and Systems (ISCAS), 2009.

Invited Talks:

1. B. Sheu, "21st Century Competitiveness of Youth in Taiwan, Coopetition Between Talents and Technologies," Winter Teachers Camp, National Chiao

Tung University, Feb. 2010.
2. B. Sheu, “21th Century Youth to Foresee the Future, Embrace the Future, and Win the Future,” Graduate Institute of Communication Engineering, National Taiwan University, May 2010.
3. A. Slavova, “Mathematical models of risk management and their CNN realization”, Workshop on Nonlinear PDEs and Applications to Finance”, Bologna, October 16, 2010.
4. J. Suykens, 15th IFAC Symposium on System Identification, SYSID 2009, semi-plenary talk (Saint-Malo France, July 2009)
5. J. Suykens, invited talk at SYNCLINE 2010: Synchronization in Complex Networks, Theory and Applications in Neuroscience and Climatology - 458th WE-Heraeus-Seminar, Physikzentrum Bad Honnef, Germany
6. C. Wu, "Transformational Hybrid Systems: The Next Generation of System Architecture", Keynote talk, 12th IEEE CNNA, International Workshop on Cellular Nanoscale Networks and their Applications, Berkeley, CA, Feb 3-5, 2010.
7. C. Wu, "On some aspects of digital halftoning algorithms: stability, implementations and applications beyond printing", EECS Seminar, University of California at Merced, Nov 30, 2009.
8. C. Wu, "Global Technology Outlook 2009" and "Synchronization and consensus in networks of coupled nonlinear circuits and systems," EECS/CASE Colloquium, Syracuse University, Oct. 14, 2009.
9. C. Wu, "Graph Laplacian Matrices and Multipartite Entanglement in Quantum Mechanics," International Workshop on Complex Systems and Networks, University of Bristol, Bristol, United Kingdom, July 20-22, 2009.
10. C. Wu, "Sensor placement and coverage: tools from geometry and image processing," Keynote talk, MITACS Workshop on Decision Support, Information Fusion and Sensor Networks, University of Calgary, Calgary, Canada, June 18-19, 2009.
11. C. Wu, Hong Kong CityU-PolyU Joint Seminar Series on Chaos and Complex Networks, City University of Hong Kong, Hong Kong, May 29, 2009.

Editorial board:

1. B. Sheu, Editorial Board Member, Proceedings of the IEEE, 2008 – 2010.
2. Á. Rodríguez and R. Carmona, and G. Liñán: editors of SPIE Proceedings, Vol. 7365.
3. A. Slavova: Editor in chief of International Journal of Neural networks and Applications
4. J. Suykens, Associate Editor IEEE Circuits and Systems Magazine (2010-2011)
5. J. Suykens, Guest associate editor International Journal of Bifurcation and Chaos (2010-2011)
6. J. Suykens, Associate Editor IEEE Transactions on Neural Networks (till 2009)
7. C. Wu, Guest associate editor International Journal of Bifurcation and Chaos
8. C. Wu, Associate Editor, NOLTA.

Conference and workshops:

1. Á. Rodríguez and R. Carmona, participated in the organization of a subconference of the SPIE's Symposium on Microtechnologies for the New Millennium 2009 in Dresden, Germany, entitled "Bioengineered and Bioinspired Systems IV".

Other activities:

1. S. Arik, Member of the Board of Governors, Asia Pacific Neural Network Assembly (APNNA)
2. S. Arik, IEEE Computational Intelligence Society (CIS), Neurodynamics Task Force Member
3. B. Sheu, Program Leader on Talents Nurturing, National SoC Program, Taiwan National Science Council.
4. B. Sheu, Head of "TSMC University Shuttle Program"

CNNA 2010 workshop in Berkeley, CA, Feb 3-5, 2010

CNNA 2010 was hosted in conjunction with the 2nd Memristor and Memristive Systems Symposium and was a great success, with the most participation in recent years, especially from industry. In particular, we had 108 registered attendees, 111 paper submissions, and 11 keynote addresses, 7 of which are from industry.

CNNA 2012

It was agreed that CNNA 2012 be held in Turin, Italy and organized by Prof. Marco Gilli with Profs. Valeri Mladenov and Angela Slavova assisting in the organization.

Membership list update: we have completed the process of classifying the membership list into 2 categories: Active members and advisory members. Advisory members will only be sent correspondences which are of general interest.

TC officers:
Chair: Chai Wah Wu
Chair-elect: Akos Zarandy
Past-chair: Marco Gilli
Secretary: Giovanni Pazienza

Vision of Cellular Nanoscale Networks and Array Computing Technical Committee

The vision of the CNNAC TC is to support and maintain the relevance of cellular nanoscale networks and array computing in CAS.

More specifically, executing on this vision requires accomplishing the following long term goals:

1. Promote research activities in CNNAC and ensuring that mainstream engineering and industrial applications embrace this area of technology.
2. Continue research activities in CNNAC including related areas such as nanotechnology.
3. Facilitate fertilization of ideas across disciplines such as biology, computer science, nanotechnology, massively multiprocessor computer architecture and system science.

The Technical Committee plans to accomplish these goals via the following action items.

1. Organize workshops, special sessions and special journal issues and attract diverse IEEE members to contribute. In particular, we plan to continue organizing the biennial CNNA workshop and attracting participants from both industry and academia. Furthermore, we plan to coordinate the CNNA workshop with other relevant workshops such as the Memristor Symposium. Other plans include initiating a regular CNN summer school and a regular 3D integration workshop starting in 2011, possibly in collaboration with the Nano-Giga TC. In addition, we will continue to promote and organize at least one special session at each ISCAS and ECCTD, promoting special issues in IEEE journals on topics relevant to the TC and having members participating in various positions of the IEEE CAS, such as BoG and DLP.
2. Leverage the expertise and experience of the TC members to define the direction of this area and identify future trends. Some possible new directions include locality dependent massive multicore/multiprocessor architectures and computing platforms, integration of non-homogenous and mixed-mode systems, implementation of neuromorphic and smart sensory hardware, computation for memristive networks, distributed memory organization and distributed algorithms.