2019 Annual Report of the Nanoelectronics and Gigascale Systems Technical Committee
IEEE Circuits and Systems Society

Malgorzata Chrzanowska-Jeske
NGTC, Chair
Antonio Rubio
NGTC Secretary

Members of NGTC contributed by publishing, presenting at conferences, offering tutorials, serving as CASS DLP speakers. They served on steering, organizing and technical committee of various IEEE and ACM conferences. They were session chairs, tutorial organizers and speakers, plenary and keynote speakers and session chairs. The members serve as Editors, Associate Editors and Guest Editors of major journal of CASS, NTC, other IEEE Societies, ACM and other organizations. They also serve as reviewers for journal and conferences. The members are active in their research fields and contribute through novelty work and breakthrough ideas and developments. During the last year a group of NGTC members contributed to updating the EdiCS for TCAS journal. The detailed contributions of NGTC members are listed below.

Report

I. Organizers: Conferences, Workshops, Panels, Special Sessions, Tutorials, etc. Specify the role

Joseph Friedman:

- Organized special session at ISCAS 2018
- Technical Program Chair of the 2018 IEEE Dallas Circuits & Systems Conference (DCAS)
- Publicity Chair of the 2019 IEEE/ACM International Symposium on Nanoscale Architectures (NANOARCH)
- Founder and Chairperson of the Texas Symposium on Computing with Emerging Technologies (ComET)
Chua-Chin Wang:
- Organized 2018 Man Submergible Design workshop

Hai Li:
- Executive committee, Design Automation Conference (DAC), 2018-
- Steering committee, IEEE Computer Society Annual Symposium on VLSI (ISVLSI), 2016-
- Steering committee, IEEE International Symposium on Smart Electronic Systems (ISES), formerly IEEE International Symposium on Nanoelectronic and Information Systems (iNIS), 2015-2018
- Steering committee, ACM International Conference on Great Lakes Symposium on VLSI (GLSVLSI), 2015-

Robert Chang:
- General Chair, IEEE International Conference on Artificial Intelligence Circuits and Systems, 2019 (The 1st edition of AICAS)
- General Chair, 2018 Taiwan and Japan Conference on Circuits and Systems
- DCS Sub-committee Chair, IEEE Asian Solid-State Circuits Conference, 2018

PE Gaillardon:
- General Chair: MPSoC’18
- Program Chair: VLSI-SoC’19
- Finance Chair: IWLS’18
- TPC member: DAC’18, DATE’19, VLSI-SoC’18, ISVLSI’19, Nanoarch’18
- Track co-chair: DATE’19
- Special session organizer: DATE’19

Thanos Stouraitis:
- Chair, Industry Forum & Exhibition, IEEE GLOBECOM 2018, Abu Dhabi, UAE

Antonio Rubio:
- Program Chair IEEE Nanoarch Conference, Greece, July 2018
- General Chair IEEE International On-Line Test Symposium (IOLTS), Barcelona, 2018

Meng-Fan (Marvin) Chang:
2019 IEEE AICAS: Demonstration Chair
2019 IEEE ISSCC: Forum co-organizer (Forum-2)
2019 IEEE VLSI-DAT: Track co-chair, Special session organizer
2018 IEDM: Executive Committee (Tutorial Chair)
2018 IEEE A-SSCC: Moderator for Panel

Jing-Li:
International Symposium on Field-Programmable Gate Arrays (FPGA)
International Symposium on Low Power Electronics and Design (ISLPED)
Area Chair for
IEEE Conference on Artificial Intelligence Circuits and Systems (AICAS)

Sorin Cotofana:
GLSVLSI 2019 (Great Lakes Symposium on VLSI), Track Chair - Emerging Computing, and Post-CMOS Technologies.
ISCAS 2019 (IEEE International Symposium on Circuits and Systems) Review Committee Member.
NANOARCH 2018 (14th ACM/IEEE International Symposium on Nanoscale Architectures), General Chair.

Kyeong-Sik:
Special workshop at DATE 2019, Mar. 25-29, 2019, in Florence, Italy. The workshop theme is on Recent Trends in Memristor Science & Technology: The Journey from Single Memristor Device towards 100 Trillion Synapses of Brain.
Kyeong-Sik Min organized the special session at ISCAS 2019, May 26-29, 2019, in Sapporo, Japan. The session title is Nonlinear, Self-oscillatory, Hybrid Circuits for Bio-Mimicking Neuronal and Synaptic Systems.

Daniele Ielmini:
Member of the NG committee of ISCAS 2018 held in Florence, Italy, May 27-30, 2018. Chaired one session at the conference, participated in the RCM of three tracks and reviewed about submitted 12 papers.
Member of the program committee of 14th ACM/IEEE International Symposium on Nanoscale Architectures (NANOARCH), July 18-19 2018, Athens, GREECE
Member of the Technical Subcommittee of IEEE International Electron Device Meeting (IEDM) 2018 for Memory Technology
Co-organizer of the International Workshop New Horizons on Neuromorphic Computing with memristive devices, Aug. 20-24, 2018, Ischia, Italy

Co-organizer of the 9th International Workshop on Memory Characterization and Modeling, Sept. 28-29, 2018, Milano, Italy

Shuenn-Yuh Lee:

- General Chair of the 29th VLSI Design/CAD Symposium (2018/8)
- Tutorial Co-Chairs of the IEEE International Biomedical Circuits and Systems (BioCAS 2019)

Georgios Sirakoulis:

- General Co-Chair of the 14th IEEE/ACM International Symposium on Nanoscale Architectures (NANOARCH 2018), Athens, Greece.
- Steering Committee Member of International Conference on Cellular Automata for Research and Industry (ACRI 2016, Fez, Morocco, ACRI 2018, Como, Italy).
- Award Committee Co-Chair of 13th Nanotechnology Materials & Devices Conference (IEEE NMDC 2018).
- Special Session Co-Chair of IEEE International Symposium of Circuits and Systems (ISCAS 2019) (Novel data sensing, storage, and computing paradigms within a common medium).

Malgorzata Chrzanowska-Jeske

- ISCAS 2019 (IEEE International Symposium on Circuits and Systems) Review Committee Member.
- 2018 IEEE NMDC (Nanotechnology Materials and Devices Conference), TPC Chair
- 2018 IEEE NMDC, Panel co-Chair
- 2018 IEEE NMDC, Special Session Organizer
- 2018 ISCAS (International Symposium on Circuits and Systems), Track Chair
- 2019 ISCAS, Track Chair
- 2018 IEEE LASCAS (Latin America Symposium on Circuits and Systems), Steering Committee Member
- 2019 IEEE LASCAS (Latin America Symposium on Circuits and Systems), Steering Committee Member
II. Invited talks: plenary sessions, keynotes, invited lectures, tutorials, …


- Plenary Speech: 2018 The 5th Philippine Semiconductor & Electronics Convention & Exhibition, Philippine, Chua-Chin Wang
- Keynote Speech: 2018 EECCIS (Electrical power Electronic Communication Control Informatic Systems) Seminar, Indonesia, Chua-Chin Wang
- Keynote Speech: 2019 Inter. Conf. on Signal Processing and Information Communications, Thailand, Chua-Chin Wang
- Keynote Speech: 2019 International Conference on Frontiers in Smart System Technologies, India, Chua-Chin Wang
- Invited Talk: 2018 The 14th International Conference on Solid-State and Integrated Circuit Technology (ICSICT 2018), China, Chua-Chin Wang

Hai Li:
IEEE Circuit and System Society (CASS) Distinguish Lecture Program (DLP) Talks on “Deep Learning and Neuromorphic Computing - Technology, Hardware and Implementation” including
a. Washington Section: College Park, MD, December 4, 2018
b. Brazil Section, Rio Grande do Sul Chapter: Federal University of Rio Grande do Sul (UFRGS), Porto Alegre, RS, Brazil, October 18, 2018
c. Brazil Section, Brasilia Chapter: University of Brasília (UnB), October 16, 2018
d. Greece Section: Aristotle University of Thessaloniki, October 9, 2018
e. Beijing Section, Shenzhen Chapter: Southern University of Science and Technology, July 11, 2018
Tutorial on “Integrating Hardware and Algorithm Advances for Cognitive Systems” Asia and South Pacific Design Automation Conference (ASPDAC), Tokyo Odaiba Waterfront, Japan, January 21, 2019. Hai Li

**Robert Chang**: Panel Speaker, IEEE Asian Solid-State Circuits Conference, 2018


“Open-source EDA innovations: From Traditional Systems to Emerging Technologies,” Emerging Technologies for EDA Workshop organized by the Ministry of Science and Technology (MOST), 21 March 2019, Hsinchu, Taiwan. **PE Gaillardon**

“What about increasing the device functionality rather than scaling them?,” Department of Electrical Engineering, 16 May 2018, KU Leuven, Leuven, Belgium. **PE Gaillardon**

**Antonio Rubio**, “Stochastic Resonance, a key factor in advanced emergent computing systems”, Universidad Técnica Federico Santa María, Chile 2019.

**Meng-Fan (Marvin) Chang**:

- 2018 IEEE APCCAS: Plenary talk
- 2018 MEMRISYS: Plenary talk
- 2018 Symp. VLSI Technology: Invited talk
- 2018 Symp. VLSI Circuits: Panelist for evening panel discussion
- 2018 DAC: Panelist
2018 SSDM: Invited talk

**Jing-Li:** Invited talks at Harvard, Yale, CMU, UCLA, UChicago, Cornell

**Sorin Cotofana:**


**Daniele Ielmini:**

- Tutorial on “Embedded memory technologies,” IEEE International Conference on IC Design and Technology (ICICDT), Otranto, Italy, June 4-6, 2018.
- Invited speech “Neuromorphic computing with emerging memory devices,” Artificial Intelligence International Conference (A2IC), Nov. 21-23, 2018, Barcelona, Spain.
- Author of the invited speech “Emerging devices and circuits for analog in-memory computing,” 2019 Design Automation and Test in Europe (DATE), March 29, 2019, Florence, Italy (speech given by my postdoc Zhong Sun).

**Shuenn-Yuh Lee:**

• “Wireless ECG Acquisition and Cardiac Stimulation SOCs for Body Sensor Networks”, tutorial speaker of 2018 IEEE Asia Solid-State Circuits Conference (A-SSCC)

**Tso-Bing Juang:**
- Invited talk, National Taipei University of Science and Technology, Taiwan. (2018/12/27)
- Invited talk, IIT at Madras, India. (AI Workshop between Taiwan and India, 2018/11/02)

**Georgios Sirakoulis:**
- Seminar: Memristive Computing: Paving the way to new computational paradigms in Electrical and Computer Engineering of University of Victoria, Victoria, Canada, 18 October, 2018.
- 4th Training International Summer School of MemoCiS, Aveiro, Portugal, 4-6 July 2018.

**Malgorzata Chrzanowska-Jeske:**
- IEEE 2018 NMDC, Nanoelectronics Materials and Devices Conference, Opening Ceremony presentation
- IEEE 2018 NMDC, Nanoelectronics Materials and Devices Conference, Award Dinner presentation
- iIEEE 2019 International Symposium on Circuits and Systems, Tutorial

### III. Society, Council, Session, Chapter officers:

**J. S. Friedman:** *Vice Chair of the Dallas Chapter of the IEEE Electron Devices Society*
Chua-Chin Wang: BoG, IEEE Tainan Section

Hai Li:
- IEEE Teaching Award Committee, 2018.
- Executive committee, ACM SIGDA, 2018-2020
- Newsletter Executive Chair, Technical Committee on Cyber-Physical Systems (TC-CPS), 2016-2018
- Treasurer, Technical Committee on VLSI (TCVLSI) under the IEEE Computer Society (IEEE-CS), 2014-

Robert Chang: IEEE Systems Council, AdCom Member (Circuits and Systems Society Primary Representative), 2016~2019

T.H. Hou:
- Member of the Board of Directors of IEEE Taipei Section
- Advisor of IEEE Electron Device Society (EDS) NCTU Student Branch Chapter

PE Gaillardon:
- IEEE CEDA Board of Governors – Liaison to IEEE Rebooting Computing Initiative
- Senior member of IEEE
- Member of ACM
- Member of IFIP Working Group 10.5

Meng-Fan (Marvin) Chang:
- Adcom for IEEE Nano Council (representative for CASS)
- President, IEEE Taipei Chapter (2019-2020)
- Chair Elect, CASS NG-TC

Jing-Li: ACM SIGDA Technical Committee on FPGAs and Reconfigurable Computing (TC-FPGA)

Shuenn-Yuh Lee:
- IEEE Tainan Section, Board of directors (2016-present)
- Taiwan IC Design Society, Board of directors (2018-present)
- IEEE Circuits and Systems Society: VLSI Systems and Applications TC
- IEEE Circuits and Systems Society: Biomedical and Life Science Circuits and Systems TC
- IEEE Circuits and Systems Society: Nanoelectronics and Gigascale TC
- IEEE Solid-State Circuits in Asian: Emerging Technologies and Applications TC Member
- Technical Program Committee Member of IEEE NEWCAS 2018
• Technical Program Committee Member of 2018 IEEE Life Sciences Conference (LSC 2018)

**Georgios Sirakoulis:**
• Vice Chair of IEEE Task Force on Unconventional Computing.
• Member of IEEE Nanoelectronics and Gigascale Systems (NG)
• Member of IEEE Cellular Nanoscale Networks and Array Computing Technical Committee (CNAAC)

**Małgorzata Chrzanowsk-Jeske**
• IEEE NTC AdCom member, CASS Representative, 2018
• IEEE NTC VP for Finances, 2019-2020
• IEEE CASS Nanoelectronics and Gigascale Systems, Technical Committee Chair, 2017-2019
• IEEE NTC Nanoelectronic Technical Committee Chair, 2017-
• IEEE NTC Nanoelectronics Technical Committee Vice Chair, IEEE Oregon Joint EPS/CAS Chapter, 2014-

**IV. Editorial services**

**J. S. Friedman:** Editorial Board Member of the Microelectronics Journal

**Chua-Chin Wang:** Associate Editor : Journal of Signal Processing Systems

**Hai Li:**
• Associate Editor, ACM Transactions on Architecture and Code Optimization (TACO), 2019-2021
• Associate Editor, IEEE Transactions on Circuits and Systems II (TCAS-II), 2018-
• Senior Editorial Board member, IEEE Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS), 2018-
• Associate Editor, IEEE Consumer Electronics Magazine (CEM), 2017-
• Associate Editor, ACM Transactions on Embedded Computing Systems (TECS), 2017-
• Associate Editor, IET Cyber-Physical Systems: Theory & Applications, 2016-
• Associate Editor, IEEE Transactions on Computer Aided Design (TCAD), 2016-
• Associate Editor, IEEE Transactions on Multi-Scale Computing Systems
Robert Chang: Guest Editor, IEEE Journal of Solid-State Circuits, 2019
T. H. Hou: Editorial board member of Scientific Reports

PE Gaillardon:
- Associate editor: TNANO
- Guest editor: TNANO, TVLSI


Antonio Rubio: Senior Editor IEEE Transactions on Nanotechnology.

Meng-Fan (Marvin) Chang:
- Associate Editor, IEEE Transactions on Very Large Scale Integration (VLSI) Systems (TVLSI) 2017-2018, 2019-2020
- Guest Editor, IEEE Journal of Solid-State Circuits (JSSC), Special issue of ISSCC 2019
- Guest Editor, IEEE TCAS-II, Special issue of ISCAS 2018

Sorin Cotofana:
- IEEE Transactions on Nanothechnology, Associate Editor in Chief.
- IEEE Transactions on Nanothechnology, Senior Editor.
- IEEE Transactions on Computers, Associate Editor.

Shuenn-Yuh Lee:
- Associate Editor of IEEE Transaction on Biomedical Circuits and Systems (2016 – present)
- Guest Editor for IEEE TBioCAS Special Issue on “Cardiovascular System Monitoring and Therapy: Innovative Technologies and Internet of Things” August 2018

Georgios Sirakoulis:
- Associate Editor of “IEEE Transactions on Nanotechnology” (IEEE).
- Associate Editor of “Microelectronics Journal” (Elsevier).
- Associate Editor of “Integration, the VLSI Journal” (Elsevier).
• Associate Editor of “International Journal of Parallel, Emergent and Distributed Systems” (Taylor and Francis).
• Associate Editor of “International Journal of Unconventional Computing” (Old City Publishing House).
• Associate Editor of “Parallel Processing Letters” (World Scientific).
• Associate Editor of “Journal of Cellular Automata” (Old City Publishing House).
• Associate Editor of “Recent Advances on Electrical & Electronic Engineering” (Bentham).

Malgorzata Chrzanowska-Jeske:
• IEEE Trans on Circuits and Systems II (TCAS II), Associate Editor 2016-2019.
• IEEE Transactions on Nanotechnology, Special Issue on 2018 NMDC, 2018-2019, Guest Editor

V. Awards and honors for year 2017-18

J. S. Friedman: Italy Young Investigator Training Program Visiting Professor at Politecnico di Torino

Chua-Chin Wang: Outstanding Technical Achievement Award, IEEE Tainan Section

Chua-Chin Wang: Distinguished Lecturer of IEEE CAS Society

Chua-Chin Wang: Best Paper Award : 2018 EECCIS (Electrical power Electronic Communication Control Informatic Systems)


T. H. Hou: Outstanding Research Award, Ministry of Science and Technology

PE Gaillardon: 2018 Chemical Engineering Education William H. Corcoran Best Paper Award

PE Gaillardon: 2018 IEEE CEDA Donald O. Pederson Best Paper Award

Meng-Fan (Marvin) Chang:
• Outstanding Industrial Collaboration Award of National Tsing Hua University, Nov. 2018
• Outstanding Research Award, Ministry of Science and Technology, Taiwan, 2018
• IEEE Fellow (class of 2019)

Jing-Li:
• NSF CAREER Award, National Science Foundation, 2018
• Best of CAL (Best Paper Award), IEEE Computer Architecture Letters, 2018
• Moore Inventor Fellowship Nominee (1 out of 2 university wide), University of Wisconsin-Madison, 2018
**Sorin Cotofana:** CASS Distinguished Lecturer 2019-2020

**Shuenn-Yuh Lee:** 2019 IEEE International Conference on Artificial Intelligence Circuits and Systems (AICAS 2019) Best Demo Award (2019/3)

**Georgios Sirakoulis:** Nomination for Best Paper Award on Electronics, Circuits and Systems in MOCAST 2018.

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VI. **IEEE Council for Electronic Design Automation (CEDA) Activities**

**Hai Li:**

**PE Gaillardon:**
IEEE CEDA Board of Governors – Liaison to IEEE Rebooting Computing Initiative

**Meng-Fan (Marvin) Chang:** Sub-committee Chair, 2019 DAC

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VII. **IEEE Nanotechnology Council (NTC) Activities**

**Hai Li:**
- Technical Committee of Nanotechnology and Gigascale System of IEEE Circuit and System Society (CASS), 2015-
- Associate Editor, IEEE Transactions on Circuits and Systems II (TCAS-II), 2018-
- Senior Editorial Board member, IEEE Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS), 2018-

**Meng-Fan (Marvin) Chang:** ADCOM (CASS representative)

**Sorin Cotofana:** IEEE NANO 2012 Organization Proposal (together with Antonio Rubio)

**Malgorzata Chrzanowska-Jeske:**
• 2018 IEEE NMDC (Nanotechnology Materials and Devices Conference), TPC Chair
• 2018 IEEE NMDC, Panel co-Chair
• 2018 IEEE NMDC, Special Session Organizer
• IEEE NTC Nanoelectronics Technical Committee co-Chair, 2017-
• IEEE NTC VP for Finances, 2019-2020

VIII. Other Professional Activities

J. S. Friedman:
• Review Committee Member of the IEEE International Symposium on Circuits & Systems (ISCAS)
• Technical Program Committee Member of the Design Automation Conference (DAC), SPIE Spintronics, the IEEE International Conference on Electronics, Circuits and Systems (ICECS), the IEEE/ACM International Symposium on Nanoscale Architectures (NANOARCH), and the ACM Great Lakes Symposium on VLSI (GLSVSI)


Hai Li: Executive committee, ACM SIGDA, 2018-2020

Robert Chang: Session Chair, ISCAS 2019

Thanos Stouraitis: Chair, Meritorious Service Award Subcommittee, IEEE CAS Society, 2019

Meng-Fan (Marvin) Chang:
• Program Director, Micro-Electronics Program, Ministry of Science and Technology (MOST), Taiwan, 2018.1-2020.12
• Sub-topic Coordinator (Next-Generation Memory), AI Edge Program (Semiconductor Moonshot), Ministry of Science and Technology (MOST), Taiwan, 2018.1-2022.05

Jing-Li:
• Technical Program Member for
  o International Symposium on Field-Programmable Gate Arrays (FPGA)
  o International Symp. on Field-Programmable Custom Computing Machines (FCCM)
  o International Symposium on Circuits and Systems (ISCAS)
• Advisory committee for International Memory Workshop

**Shueyn-Yuh Lee:**
• RCM Track Chair: Sensors, Networks and Machine Learning (NEWCAS 2018)
• Paper assign by VLSI Systems and Applications TC (ISCAS)
• Paper assign by Biomedical and Life Science Circuits and Systems TC (ISCAS)
• Paper assign by 2018 IEEE Biomedical Circuits and Systems Conference (BioCAS)
• Paper assign by 2018 Asian Solid-State Circuits Conference (A-SSCC)