2020 Annual Report (May 2019 – July 2020
CNNAC Technical Committee
IEEE Circuits and Systems Society

Chairman: Alon Ascoli
Secretary: Andras Horvath

1. Technical Committee Meeting(s):

(Please state the number of TC meetings in the past year, where held, TC meeting attendance rate, and was a quorum present.)

The CNNAC Technical Committee in the IEEE Circuits and Systems Society organizes an annual TC meeting, at ISCAS, and a biannual TC meeting at CNNA.

Detailed information about our TC meetings over the past and present years is provided below.

In 2019 we only had a single TC meeting, precisely in occasion of ISCAS in Sapporo on May 28th. Given that the symposium was organized far away from Europe, and that most of the members of our TC are Europeans, the attendance rate of the meeting was lower than it is on average (the number of attendees was equal to 9).

Due to the COVID-19 pandemic, this year CNNA conference, due to take place in Catania next September, has been postponed to summer 2021. Since ISCAS 2020 will take place in virtual mode next October, we plan to organize a CNNAC-TC meeting during the days of the symposium using some internet-based software such as Zoom.

2. Members submitted Annual Reports:

First Name	Last Name	Affiliation	Email	IEEE Grade	IEEE Region
Alon	Ascoli	Technical University of Dresden	alon.ascoli@tu-dresden.de	Member	8
Piotr	Dudek	The University of Manchester	pdudek@manchester.ac.uk	Senior Member	8
Mustak Erhan	Yalcin	Istanbul Technical University	mustak.yalcin@itu.edu.tr	Senior	8
Angela	Slavova	Bulgarian Academy of Sciences	slavova@math.bas.bg	Senior	8
Jorge	Fernández-Berni	Universidad de Sevilla	berni@imse-cnm.csic.es		8
Gert	Cauwenberghs	University of California, San Diego	gcauwenberghs@ucsd.edu	Fellow	6
Valeri	Mladenov		valerim@tu-sofia.bg	Senior Member	8
Chai Wah	Wu	IBM T. J. Watson Research Center	chaiwahwu@ieee.org	Fellow	1
Ricardo	Carmona-Galán	Universidad de Sevilla	rcarmona@imse-cnm.csic.es	Senior Member	8

3. Accomplished Technical Activities

3.1. IEEE Conference/Event organizations
(Please highlight conference/events are technically and financially co-sponsored by the CAS Society)

Your Name	Conference Sponsors	Conference/Event Title	Your Role

Jorge Fernández-Berni	IEEE CAS	ISCAS 2020	Demo Chair
Alon Ascoli		MEMRISYS 2019	Technical Program Chair
Ronald Tetzlaff		MEMRISYS 2019	Conference Chair
Piotr Dudek	IEEE CAS	ISCAS 2020	Demo Co-Chair
Mustak E. Yalcin	IEEE CAS	The 26th IEEE International Conference on Electronics Circuits and Systems (ICECS)	Technical Program Committee member
Mustak E. Yalcin	IEEE CAS	the International Conference on Modern Circuits and Systems Technologies (MOCAST) 2020	Technical Program Committee member
Chai Wah Wu	IEEE CAS	ISCAS 2020	Co-chair Special Session Committee
Valeri Mladenov	IEEE CAS	MOCAST 2019	PC Member, author
Gert Cauwenberghs		BioCAS 2019	Special sessions Co-Chair
Gert Cauwenberghs	IEEE	EMBS Symposium and Workshop on Brain, Mind, and Body (BMB): Cognitive Neuroengineering for Health and Wellness	Chair and co-organizer
Gert Cauwenberghs	IEEE	International Solid-State Circuits Conference (ISSCC) Imagers, Medical, MEMS and Displays (IMMD)	Sub-Committee member
Ricardo Carmona-Galán	IEEE	ISCAS 2020	Technical Program Committee Chair
Ricardo Carmona-Galán		Workshop on the Architecture of Smart Cameras 2019	Advisory Board

3.2. IEEE Journal Editorships:
(Please highlight the journals that are (co-)sponsored by the CAS Society)

Your Name	Journal Sponsors	Journal Title	Your Role
Mustak E. Yalcin	IEEE CAS	IEEE Trans. on Circuits and Systems –II	Associate Editor
Ronald Tetzlaff		IEEE Trans. on Circuits and Systems –II	Associate Editor (till 31 Dec 2019)
Ronald Tetzlaff		International Journal of Circuit Theory and Applications	Associate Editor
Chai Wah Wu	IEEE CAS	IEEE Circuits and Systems Magazine	Editor-in-Chief
Gert Cauwenberghs		Proceedings of the IEEE	Editorial Board Member
Gert Cauwenberghs		IEEE Transactions on Biomedical Engineering	Editorial Board Member
Gert Cauwenberghs		Neuromorphic Engineering, Frontiers in Neuroscience	Associate Editor
Ricardo Carmona-Galán		Journal of Real-Time Image Processing, Springer (ISSN 1861-8200)	Associate Editor

3.3. Awards, Honors, and Recognition
(Fellow, Distinguished Lecturer, Outstanding Service, Best Paper Awards, and so on by the CAS Society)

Your Name	Awards / Honors / Recognition	Period

3.4. Keynote Speeches/Invited Talks:

Your Name	Invited by	Event/Conference Title	Talk Title	Date
Alon Ascoli	Department of Electrical and Electronic Engineering Faculty of Science and Engineering	Invited lecture	Theory of Memristors	31-05-2019

	Hosei University			
Alon Ascoli	Democritus University of Thrace, Xanthi, Greece	Invited lecture	Nonlinear system-theoretic concepts for bio-inspired circuit design	28-04-2020
Alon Ascoli	Texas A&M University, College Station, Texas, USA	Invited lecture	A Truly-Systematic Technique For Mem-Computing Cellular Array Design	22-05-2020
Alon Ascoli	Department of Physical Electronics, Faculty of Engineering, Tel-Aviv University, Tel Aviv, Israel	Invited lecture	Nonlinear system-theoretic methods for bio-inspired circuit analysis and design	09-01-2020
Alon Ascoli	Ettore Majorana Centre for Scientific Culture in Erice, Italy	Workshop on New Trends in Nonequilibrium Stochastic Multistable Systems and Memristors (NES)	A novel system-theoretic technique to analyze and design mem-computing M-CNNs	19-10-2019
Ronald Tetzlaff	Ettore Majorana Centre for Scientific Culture in Erice, Italy	Workshop on New Trends in Nonequilibrium Stochastic Multistable Systems and Memristors (NES)	Real-time computing by Memristor Cellular Nonlinear Networks (M-CNN)	19-10-2019
Ronald Tetzlaff	organizers	IEEE International Workshop on Future Computing (IWOFC) in Hangzhou, China	How to program universal mem-computing arrays?	14-12-2019
Ronald Tetzlaff	organizers	26th IEEE International Conference on Electronics Circuits and Systems (ICCECS), Genova, Italy	Universal mem-computing by Memristor Cellular Nonlinear Networks	28-11-2019
Ronald Tetzlaff	organizers	Inaugural Chua Memristor Institute Conference (ICMIC), Wuhan, China	Cellular mem-computers for brain-like information processing in IoT systems	12-11-2019
Ronald Tetzlaff	organizers	Plenary talk at the 5th International Interdisciplinary Chaos Symposium on Chaos and Complex Systems, Antalya, Turkey	Edge of Chaos in Memristor Networks	10-05-2019
Piotr Dudek	organisers	Workshop on Unconventional Sensors in Robotics: Perception for Online Learning, Adaptive Behaviour, and Cognition, IEEE International Conference on Robotics and Automation, ICRA 2020, Paris	Pixel Processor Arrays for Low Latency Vision on Agile Robots	04/07/2020
Piotr Dudek	organisers	NEUROTECH International Forum on Neuromorphic Computing, Leuven, Belgium	Running a CNN on the sensor	4/11/2019
Piotr Dudek	organisers	Workshop on Rethinking Computing Architectures for Big Data and AI, Belfast	Extreme edge computing	23/10/2019
Piotr Dudek	organisers	Second International Workshop on Event-based Vision and Smart Cameras, International Conference on Computer Vision and Pattern Recognition, CVPR 2019, Long Beach	SCAMP-5: Vision Sensor with Pixel Parallel SIMD Processor Array	17/06/2019
Ricardo Carmona-Galán		EP-ESE Electronics Seminars. CERN, Geneve, Switzerland	In-sensor processing for high-speed low-power 2D and 3D imaging	25/02/2020
Gert Cauwenberghs		*Joint Symposium on Neural Computation (JSNC'2019),*	Memory-Efficient Neuromorphic Learning and Inference	01/06/2019

		University of Southern California, Los Angeles CA		
Gert Cauwenberghs		*Telluride Neuromorphic Cognition Workshop*, Telluride CO	Memory-Efficient Neuromorphic Learning and Inference	10/07/2019
Gert Cauwenberghs		*Industry-University Workshop on Sensors and Machine Learning (SensMACH-2019)*, SEMI MSEC 2019, Coronado CA	Neuromorphic Computing on the Edge: Micropower Event-Driven Learning Machines	22/10/2019
Gert Cauwenberghs		*Semiconductor Research Corporation Decadal Plan for Semiconductors Workshop on New Trajectories for Analog Electronics*, IBM Almaden CA	High-Density Neural Interfaces for Pervasive Human-Machine Interaction	12-13/12/2019
Gert Cauwenberghs		Keynote Lecture, *2020 Workshop on Navy Applications of Machine Learning (NAML'2020)*, Naval Information Warfare Center Pacific, San Diego CA	Complexity, Efficiency, and Resilience in Large-Scale Neuromorphic Computing	24/02/2020

3.5. Other distinguished IEEE services
(For example, CAS BoG, Region/chapter leadership, TC chairs/secretary)

Your Name	Organization	Position/Activities	Period
Alon Ascoli	CNNAC	TC Chair	May 2019 – May 2021
Andras Horvath	CNNAC	TC Secretary	May 2019 – May 2021
Chai Wah Wu	IEEE CAS	DLP selection committee member	2020-2021
Valeri Mladenov	TU-Sofia, Bulgaria	IEEE Bulgaria Section, Educational Activities Officer	2018-
Ricardo Carmona-Galán		Secretary IEEE CASS Tech Com Sensory Systems	
Ricardo Carmona-Galán		ISCAS Steering Committee Member	

5. TC Significant Technical Leadership and Innovations

Please list 5 (or less) most significant TC activities in the past year, for example, but not limited to
  (1) Established/organized new CASS journals/conferences/workshops
      a. Please include title, scope, status (e.g., submissions, published papers)
  (2) Organized special issues in CASS journal, special sessions/tutorials in CASS conferences, CASS seasonal schools, CASS industrial forums, or CASS competitions
      a. Please include title, the guest editors/organizers, the year, and the month, the number of submissions, the number of papers published, and the impacts (e.g., the total number of citations/full text views so far or the total number of attendees)
  (3) Organized new CASS initiatives
  (4) Established cross-TCs/SIGs collaborations
  (5) Awards received by the TC or the TC members

Members of the CNNAC-TC, namely A. Ascoli, R. Tetzlaff, A. Horvath, and G. Sirakoulis, organized special sessions, focused on topics of interest to our TC, for the programs of major international scientific conferences. Particularly,

- A. Ascoli, G.Ch. Sirakoulis, and R. Tetzlaff, Special Session on "Sensing and Unconventional Mem-Processing with Multi-Functional Memristors", IEEE ECCTD, Sofia (Bulgaria), 07-10 Sept. 2020
- G.Ch. Sirakoulis, R. Tetzlaff, A. Ascoli, Sung-Mo "Steve" Kang, Special Session on "Bio-inspired memristive systems for sensing and processing", IEEE ISCAS, Seville (Spain), 12-14 Oct. 2020

- R. Tetzlaff, A. Ascoli, "Theory and applications of memristors, the key technology enabler for IC performance growth beyond the Moore era", IEEE ICECS, Genova (Italy), 27-29 Nov. 2019
- R. Tetzlaff, A. Ascoli, G. Ch. Sirakoulis, A. Horvath, and Y. Nishio, Special Session on "Novel data sensing, storage, and computing paradigms within a common medium", IEEE ISCAS, Sapporo (Japan), 26-29 May 2019

Importantly R. Tetzlaff and A. Ascoli organized the Third International Conference on Memristive Materials, Devices & Systems (MEMRISYS) over the time period 8-11 July 2019 (all details may be found at the web address https://www.iee.et.tu-dresden.de/mem2019/).

Furthermore, R. Tetzlaff and A. Slavova, together with L. Chua, are coediting a Springer book entitled "Memristive Computing Systems", due to be sent to production, and available on the market by the end of 2020.

Finally, Ricardo Carmona-Galán is presently the Secretary of the IEEE CASS Sensory Systems. A promotion of the cooperation between the CNNAC-TC and the Sensory Systems TC is on our 2021 agenda.