

2023 Annual Report (June 2022 – May 2023)
Cellular Neural Networks and Array Computing Technical Committee/
Special Interest Group
IEEE Circuits and Systems Society

Chairman: Alon Ascoli
Chair-Elect/Secretary: András Horváth

1. Technical Committee/Special Interest Group Meeting(s):

Please provide information on the TC/SiG meetings held in the past year, including date, time, location, attendance rate, and if a quorum was present.

2. Voting Members:

First Name	Last Name	Affiliation	Email	IEEE Grade	IEEE Region
Ahmet	Samil Demirkol	TU Dresden	ahmet_samil.demirkol@tudresden.de	Member	8
Akos	Zarandy	Hungarian Academy of Sciences	zarandy@sztaki.hu	Senior Member	8
Alberto	Tesi	University of Florence, Italy	alberto.tesi@unifi.it	Member	8
Alex	James	Digital University Kerala			10
Alexander	Serb	University of Southampton	A.Serb@soton.ac.uk		8
Alkis	A. Hatzopoulos	Aristotle University of Thessaloniki			8
Alon	Ascoli	TU Dresden	alon.ascoli@tu-dresden.de	Senior Member IEEE	8
Andras	Horvath	Peter Pazmany Catholic University	horvath.andras@tk.ppke.hu	Member	8
Angela	Slavova	Bulgarian Academy of Sciences	slavova@math.bas.bg	Senior	8

Ari	Paasio	Kovilta Ltd.	ari.paasio@kovilta.fi		8
Arturo	Buscarino	University of Catania, Italy	Arturo.buscarino@unict.it	Senior	8
Bernabe	Linares-Barranco	Instituto de Microelectrónica de Sevilla	bernabe@imse-cnm.csic.es		8
Chai Wah	Wu	IBM T. J. Watson Research Center	chaiwahwu@ieee.org	Fellow	1
Chi	Tse	City University of Hong Kong	chitse@cityu.edu.hk		10
Christos	Papavassiliou	Imperial College London	c.papavas@imperial.ac.uk		8
Daniele	Ielmini	Politecnico di Milano	Daniele.ielmini@polimi.it	Fellow	8
Dimitra	Georgiadou	University of Southampton	D.Georgiadou@sonoton.ac.uk		8
Fernando	Corinto	Politecnico di Torino	fernando.corinto@polito.it		8
Georgios	Sirakoulis	Democritus University of Thrace	gsirak@ee.duth.gr		8
Gert	Cauwenberghs	University of San Diego	gcawwenberghs@ucsd.edu	Fellow	6
Giacomo	Innocenti	University of Florence	giacomo.innocenti@unifi.it		8
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John Paul	Strachan	FZ Jülich	j.strachan@fz- juelich.de		8
Jorge Fernández	Berni	Universidad de Sevilla	berni@imse- cnm.csic.es		8
Joshua	Yang	University of Southern California	jjoshuay@usc.edu		6
Kristóf	Karacs	Peter Pazmany University	Karacs.kristof@it k.ppke.hu		8
Leon	Chua	University of California, Berkeley	lchua2916@gmai l.com		6
Lucia Valentina	Gambuzza	University of Catania, Italy	Lucia.gambuzza @dieei.unict.it	Senior	8
Luigi	Fortuna	University of Catania, Italy	luigi.fortuna@uni ct.it	Senior	8
Maciej	Ogorzalek	Jagiellonian University	maciej.ogorzalek @uj.edu.pl		8
Maide	Bucolo	University of Catania, Italy	Maide.bucolo@u nict.it	Senior	8
Mattia	Frasca	University of Catania, Italy	mattia.frasca@die ei.unict.it	Senior	8
Mauro	Di Marco	University of Siena, Italy	dimarco@diism.u nisi.it		8
Mauro	Forti	University of Siena, Italy	forti@diism.unisi.it	Senior	8
Mika	Laiho	University of Turku	mlaiho@utu.fi		8

Mohamad	Moner Al Chawa	TU Dresden	mohamad_moner.alchawa@tu-dresden.de		8
Mustak E.	YALCIN	Istanbul Technical University	mustak.yalcin@itu.edu.tr	Senior Member	8
Neil T	Kemp	University of Nottingham	Neil.Kemp@nottingham.ac.uk		8
Nerhun	Yildiz	Intel	nerhun.yildiz@intel.com		8
Paolo	Arena	University of Catania	paolo.arena@unicat.it		8
Paolo	Civalleri	Politecnico di Torino	pier.civalleri@polito.it		8
Marco	Gilli	Politecnico di Torino	marco.gilli@polito.it	Senior Member	8
Peter	Szolgay	Peter Pazmany University	Szolgay.peter@itk.ppke.hu	Senior Member	8
Piotr	Dudek	University of Manchester	pdudek@manchester.ac.uk	Senior Member	8
Qiangfei	Xia	University of Massachusetts at Amherst	qxia@umass.edu		2
Ricardo	Carmona Galán	Instituto de Microelectrónica de Sevilla	ricardo.carmona@csic.es	Senior Member	8
Richard	Schroedter	TU Dresden			8
Ronald	Tetzlaff	TU Dresden	ronald.tetzlaff@tu-dresden.de	Senior Member	8
Sabina	Spiga	CNR-IMM–Unit of Agrate Brianza, Italy			8
Sabri	Arik	Istanbul University-Cerrahpasa	ariks@istanbul.edu.tr		8

Salvina	Gagliano	University of Catania, Italy	salvina.gagliano@unict.it	Senior	8
Shahar	Kvatinsky	Technion, Israel Institute of Technology	shahar@ee.technion.ac.il	Senior Member	8
Stan	Williams	Texas A&M University	stan.williams@tamu.edu		3
Stefan	Slesazeck	NaMLab, Dresden	Stefan.Slesazeck@namlab.com		8
Stephan Menzel		FZ Jülich	St.menzel@fz-juelich.de	Senior Member	8
Sung-Mo Steve Kang		University of California Santa Cruz	skang@ucsc.edu		6
Tingwen	Huang	Texas A&M University at Qatar			8
Valeri	Mladenov	Technical University of Sofia	valerim@tu-sofia.bg	SM	8
Vasileios	Ntinas	TU Dresden			8
Xuan	Hu	UT Dallas/Apple Inc.			2

Geographical distribution of TC/SIG members (percentage of total)

	2022
Total number of TCs	65 %
Regions 1 – 6 (U.S.A.)	12% (8)
Region 7 (Canada)	0
Region 8 (Europe/Africa, Middle East)	85% (55)
Region 9 (Central/South America)	0
Region 10 (Asia/Pacific)	3% (2)

Gender distribution of TC/SIG members (percentage of total)

	2022
Total number of TCs	%
Male	9% (6)
Female	91%5 (59)

Distribution of TC/SIG members by affiliation (percentage of total)

	2022
Total number of TCs	%
Academia	90 (58)
Industry	10% (7)
Government	0

3. Accomplished Technical Activities

3.1. IEEE Conference/Event organizations

(First priority, please highlight conference/events technically and financially co-sponsored by the CAS Society)

Your Name	Conference Sponsors	Conference/Event Title	Your Role
Alon Ascoli, A. James	IEEE CAS	IEEE CASS Seasonal School on "Intelligence in Chips: Integrated Sensors and Memristive Computing", 1-7, November 2022, https://www.intelligentchip.org	Organizers, together with B. Choubey
Alon Ascoli, R. Tetzlaff, G. Ch. Sirakoulis, S. Menzel	IEEE CAS	ISCAS 2022	Special Session Organizers
J.P. Strachan, Alon Ascoli, R. Tetzlaff, G. Ch. Sirakoulis	IEEE CAS	ISCAS 2023	Special Session Organizers
Alon Ascoli	IEEE CAS	Nano 2022	Special Session Chair
Alon Ascoli, R. Tetzlaff, G.Ch. Sirakoulis, A. Rubio, S. Kang, and S. Menzel	IEEE CAS	Nano 2022	Special Session Organizers
Alon Ascoli, R. Tetzlaff	IEEE CAS	ISCAS 2023	Tutorial Providers
Alon Ascoli, R. Tetzlaff, F. Corinto, and D. Ielmini	IEEE CAS	MetroXRINE 2023	Special Session Organizers
Alon Ascoli, R. Tetzlaff, G.Ch. Sirakoulis, and A. Slavova	IEEE CAS	ICECS 2022	Special Session Organizers
Daniele Ielmini	IEEE CAS	ISCAS	RCM
Daniele Ielmini	IEEE CAS	DATE	Technical committee member and reviewer
Mustak E. Yalcin	IEEE CAS	CASS Outreach Camp on Computation Circuits (info: http://cassnewsletter.org/chapter-news-2.html)	Co-chair

Prof. Shahar Kvatinsky	IEEE CAS	mm-Wave Imaging for Automotive and Beyond	Organizer - IEEE Israel Circuits and Systems chair
Prof. Shahar Kvatinsky	IEEE CAS	Using CMOS for Optical Communication	Organizer - IEEE Israel Circuits and Systems chair
Prof. Shahar Kvatinsky	IEEE CAS	Optimizing Emerging Graph Applications Using Hardware-Software Co-Design	Organizer - IEEE Israel Circuits and Systems chair
Prof. Shahar Kvatinsky	IEEE CAS	Integrated Circuits and Systems for Immersive Connectivity and Sensing-ICS2	Organizer - IEEE Israel Circuits and Systems chair
Prof. Shahar Kvatinsky	IEEE CAS	Circuits and technologies for implantable biomedical devices	Organizer - IEEE Israel Circuits and Systems chair
Prof. Shahar Kvatinsky	IEEE CAS	On-chip communication: from architectures to circuits	Organizer - IEEE Israel Circuits and Systems chair
Valeri Mladenov	IEEE CAS	MOCAS2022	PC Member, author
Gert Cauwenberghs	IEEE Brain (including CAS)	IEEE Brain Discovery Neurotechnology Workshop-- Brain, Mind, and Body: Cognitive Neuroengineering for Health and Wellness (San Diego, CA)	Co-Chair

(Second priority, please highlight conference/events technically by the CAS Society)

Your Name	Conference Sponsors	Conference/Event Title	Your Role
Alon Ascoli	IEEE CASS	MOCAS2022, MOCAS2023	Special Session Co-Organizer
Ronald Tetzlaff	IEEE CASS	MOCAS2022, MOCAS2023	Special Session Co-Organizer

Please don't report conference/events that are NOT sponsored by the CAS Society. Thank you!

3.2. IEEE Journal Editorships:

(Please highlight the journals that are (co-)sponsored by the CAS Society, cf., <https://ieeecas.org/publications>)

Your Name	Journal Sponsors	Journal Title	Your Role
Alon Ascoli	IEEE CAS	IEEE Transactions on Circuits and Systems-I: Regular Papers	Associate Editor (since March 28, 2023)
Chai Wah Wu	IEEE CAS	IEEE JETCAS	Senior editorial board member
Mustak Erhan Yalcin	IEEE CAS	IEEE Transactions on Circuits and Systems II	Associate Editor
Valeri Mladenov	IEEE CAS	Trans. CAS I, Trans. CASII	reviewer

Please don't report journals that are NOT sponsored by the CAS Society. Thank you!

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
S. Kang, A.S. Demirkol, J. Eshraghian, A. Ascoli, R. Tetzlaff, and L.O. Chua	IEEE Transactions on Circuits and Systems Darlington Best Paper	2023
Angela Slavova	MOCAS2022, Bremen, Germany- nominated for best paper	
Piotr Dudek	Best Demo Award, International Conference on Computational Photography, ICCP 2022	August 2022

3.4. Keynote Speeches/Invited Talks:

Your Name	Invited by	Event/Conference Title	Talk Title	Date
Alon Ascoli	Alberto Garcia-Ortiz and Spiros Nikolaidis	MOCASST 2022	Edge of Chaos Theory Explains Smale Paradox	10-06-2022
Alon Ascoli	MEMRISYS Technical Program Committee	MEMRISYS 2022	Edge of Chaos Theory Explains the Origin for Fundamental Bifurcation Phenomena in Memristive Biological Systems	30-11-2022
Alon Ascoli	Bhaskar Choubey and Alex James	IEEE CASS Seasonal School on "Intelligence in Chips: Integrated Sensors and Memristive Computing" 1-7, November 2022, https://www.intelligentchip.org	Edge of Chaos Clarifies the Origin for Yet-Unexplained Nonlinear Phenomena in Biological Systems	05-11-2022
András Horváth	conference committee	15th International Conference on Digital Image Processing	Why is understanding crucial? Intriguing failures of machine learning	May 2022
András Horváth	conference committee	5th Asia Symposium on Image Processing	Preventing adversarial attacks in deep neural networks	June 2022
András Horváth	conference committee	30th Summer School on image Processing	The role of adversarial attacks in deep neural networks	July 2022
Angel Slavova	conference committee	FDE 2022, Ariel, Israel- plenary talk		2022
Angela Slavova	conference committee	NTADES 2022, Sozopol, Bulgaria- plenary talk		2022
Daniele Ielmini	A. Bosio	IEEE DAC	Resistive switching memory (RRAM): from device technology to applications in computing	July 10, 2022
Fernando Corinto	Alon Ascoli	IEEE CASS Seasonal School on "Intelligence in Chips: Intelligent Sensors and Memristive Computing"	Memristor Computing Systems: at the crossroad between Circuit Theory and Artificial Intelligence	November 4, 2022
Fernando Corinto	Sabina Spiga	COSMO Workshop Satellite event of Symposium FH, CIMTEC 2022, 9th Forum on New Materials	The COSMO project: Analogue Computing with Dynamic Switching Memristor Oscillators: Theory, Devices and Applications	June 25, 2022
Geoffrey W. Burr	conference committee	ISPSA – International Symposium on the Physics of Semiconductorsxxx	Analog AI: Deep learning with Non-volatile Memoryxxx	July 2022
Geoffrey W. Burr	conference committee	Neuromorphic Materials, Devices, Circuits and Systems (NeuMatDeCaS)	Analog-AI: Hardware Acceleration for Deep Neural Network Inference (Invited)	January 2023
Piotr Dudek	BAE Systems	seminar	In-pixel computing: Vision sensors with pixel-parallel processor arrays	29/03/2022
Prof. Shahar Kvatinsky	Jeewan Kim, MIT	MEMRISYS 2022, Cambridge, MA, USA	Real Digital Processing-in-Memory with the Memristive Memory Processing Unit	November 2022
Prof. Shahar Kvatinsky	Remi Monasson, CNRS	CNRS AISSAI Workshop of Energetics of Computation in Artificial and Natural Networks, Paris, France	On-Device Machine Learning with Memristors in the Neuromorphic Era	December 2022
Prof. Shahar Kvatinsky	Melvin Galicia, Aachen University	HiPEAC conference, Budapest, Hungary	On-Device Machine Learning with Memristors in the Neuromorphic Era	June 2022
Prof. Shahar Kvatinsky	Pedram Khalili, Northwestern	Northwestern University Seminar	Making Real Memristive Processing-in-Memory Faster and Reliable	November 2022

Prof. Shahar Kvatinsky	Dr. Alon Ascoli, TU Dresden	IEEE Circuits and Systems Society Seasonal School on Intelligence in Chips: Integrated Sensors and Memristive Computing	Making Real Memristive Processing-in-Memory Faster and Reliable	November 2022
Prof. Shahar Kvatinsky	Yijun Chui, NUA	Nanjing University of Aeronautics and Astronautics, China	Making Real Memristive Processing-in-Memory Faster and Reliable	August 2022
Stephan Menzel	Fernando Corinto	COSMO Workshop, Perugia, Italy	Exploiting the Stochastic Switching Behavior of Memristive Devices	June 24 th 2022
Stephan Menzel	Sabina Spiga	CIMTEC 2022, Perugia, Italy	Physic based simulation of ReRAM for neural network applications	June 25 th -29 th 2022
Stephan Menzel	Alon Ascoli	CASS Seasonal School, virtual conference	Modeling of Memristive Devices	November 1 st to 7 th , 2022
Stephan Menzel	Bilge Yildiz	Solid State Ionics 23, Boston	On the Conduction Mechanism of Valence Change Memories	July 17 th to 22 nd 2022
Stephan Menzel	Rainer Waser	Juelich Aachen Neuromorphic Computing Day, Jülich	Reliability Aspects of CIM Operations based on VCM Devices	May 25 th 2022
Stephan Menzel	conference committee	European Conference on Optical Communication, Basel	Exploiting the Dynamics of Memristive Devices Based on the Valence Change Mechanism for Analog Computing	
Gert Cauwenberghs	INE	Forum on Future Directions for Neuromorphic Engineering, 2022 Telluride Neuromorphic Cognition Engineering Workshop	Neuromorphic Technology Soul-Searching	July 2, 2022
Gert Cauwenberghs	Google	Google	Efficient and Versatile Neuromorphic Computing in Resistive Random-Access Memory	Sept. 2, 2022
Gert Cauwenberghs	TinyML	TinyML Forum on Neuromorphic Engineering	Towards 'Greener' AI on the Edge: Energy-Efficient Neuromorphic Learning and Inference	Sept. 27, 2022
Gert Cauwenberghs	Sandia National Laboratories	COINFLIPS Seminar	Efficiency and Resilience in Large-Scale Neuromorphic Intelligence at the Edge	Nov. 8, 2022
Gert Cauwenberghs	ICRC	IEEE Int. Conf. Rebooting Computing (ICRC'2022)	Thermodynamic Limits of Low-Energy Neuromorphic Computing	Dec. 8, 2022
Gert Cauwenberghs	NSF	Functional Logic of Neural Circuits: Diamonds in the Rough	Neuromorphic Accelerators and Silicon Models of Neural Circuits	Febr. 23, 2023
Gert Cauwenberghs	Sandia National Laboratories	AI-Enhanced Co-Design for Next Generation Microelectronics (AICOM)	Ultra-Low Power Integrated Silicon and Memristive Neuromorphic Microelectronics for Engineered Natural Intelligence at the Edge	April 4, 2023
Gert Cauwenberghs	NICE	Keynote, 2023 Neuro-Inspired Computing Elements (NICE 2023)	Versatility, Efficiency, and Resilience in Large-Scale Neuromorphic Intelligence at the Edge	April 16, 2023
Gert Cauwenberghs	ISRDS	Keynote, IEEE 2023 Int. Symp. Roadmapping Devices and Systems (ISRDS)	Thermodynamic Limits of Low-Energy Neuromorphic Computing	May 4, 2023

3.5. Other distinguished IEEE services

(For example, CAS BoG, Region/chapter leadership, TC chair/secretary)

Your Name	Organization	Position/Activities	Period
Alon Ascoli	CASS	CNN-MAC TC Chair	2021-2023
András Horváth	IEEE RAS	Program Committee Co-Chair of The 9th International Conference on Mechatronics and Robotics Engineering	2022, 2023
Chai Wah Wu	EAB	ABET EAC Commissioner	2018-present
Mustak ErhanYalcin	IEEE CASS Turkey Chapter	Chair	2022-2024

Stephan Menzel	Forschungszentrum Juelich GmbH	Associate Editor Journal of the Electron Devices Society	Since 2020
Valeri Mladenov	TU-Sofia, Bulgaria	IEEE Bulgaria Section, Educational Activities Officer	2018-
Gert Cauwenberghs	IEEE Brain (including CAS)	Steering Committee	2021-current

4. TC Significant Technical Leadership and Innovations

Please list 5 (or less) most significant TC/SIG 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)

A. Ascoli, R. Tetzlaff, G. Ch. Sirakoulis edited with Shimeng Yu a special issue on “Memristive Circuits and Systems for Edge-Computing Applications” for the IEEE Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS). Publication: December 2022

V. Ntinias organized a special session entitled “Shaping Future Electronic Circuits and Systems with Emerging Memory Devices,” at the IEEE CASS International Conference on Synthesis, Modeling, Analysis and Simulation Methods, and Applications to Circuit Design (SMACD), to be held in Funchal, Madeira, Portugal, July 3-5, 2023

A. Ascoli, R. Tetzlaff, G.Ch. Sirakoulis, and S. Menzel organized a Special Session on “Recent Progress in Theory and Applications of Memristive Technologies Toward a New Era in Electronics,” IEEE ISCAS, Austin, Texas, USA, 28 May - 1 June 2022

R. Tetzlaff, and A. Ascoli organized a Special Session on “Fifty Years of Memristors: History, State-of-the-Art, Future Opportunities and Challenges Ahead,” IEEE International Conference on Modern Circuits and Systems Technologies (MOCAS), Bremen (Germany), 10 June 2022

A. Ascoli, G.Ch. Sirakoulis, R. Tetzlaff, A. Rubio, S. Kang, and S. Menzel organized a Special Session on “State-of-the-Art, Open Issues, and Future Trends on Resistance Switching Memories: The Enabling Nanotechnologies for the More-than- Moore Era,” IEEE Nano, Palma de Mallorca (Spain), 8 July 2022

A. Ascoli, R. Tetzlaff, G.Ch. Sirakoulis, and A. Slavova organized a Special Session on “Innovations in Memristor Modelling, Analysis, and Fabrication Toward a Systematic Approach to Circuit and System Design,” IEEE International Conference on Electronics, Circuits and Systems (ICECS), Glasgow (Scotland), 24-26 October 2022

A. Ascoli, R. Tetzlaff, J.P. Strachan, and G.Ch. Sirakoulis organized a Special Session on “Latest Memristor-Enabled Innovations in Circuits and Systems,” IEEE ISCAS, Monterey, California, (USA), 21-25 May 2023

A. Ascoli, and R. Tetzlaff organized a Special Session on “Novel Theoretical and Practical Developments in Memristor Device, Circuit, and System Research,” IEEE International Conference on Modern Circuits and Systems Technologies (MOCASST), Athens (Greece), 28-30 June 2023

(3) Organized new CASS initiatives

A. Ascoli and A. James organized together with B. Choubey a CASS Seasonal School on “Intelligence in Chips: Integrated Sensors and Memristive Computing”, 1-7 November 2022, <https://www.intelligentchip.org>

(4) Established cross-TCs/SIGs collaborations

(5) Awards received by the TC/SIG or the TC/SIG members

S. Kang, A.S. Demirkol, J. Eshraghian, A. Ascoli, R. Tetzlaff, and L.O. Chua have been conferred the 2023 IEEE Transactions on Circuits and Systems Darlington Best Paper.

5. New plans for the next year

Are there any new initiatives, workshops, journal special issues, conference special sessions, etc., that your TC or TC members are planning for the next year?

The IEEE 30th International Conference on Electronics, Circuits and Systems (ICECS) will be held in Istanbul, Turkey 4-7 December 2023. This is a flagship conference of the IEEE Circuits and Systems Society in Region 8 (Europe, Middle East, and Africa). For more data, visit <https://icecs2023.isikun.edu.tr> Prof. Mustak Erhan Yalcin is one of the Technical Program Chairs of the conference.

The 2023 edition of the flagship conference of our TC, namely the CNNA, including the Memristor and Memristive Symposium, shall be organized by Prof. G.Ch. Sirakoulis between the 3rd and the 6th of October this year. Xanthi (Greece) will host the conference. See <https://cnna.duth.gr> for more news.

A special session on “Memristor Models, Devices, Circuits and Systems for Artificial Intelligence Applications” is organized by Dr. A. Ascoli, Prof. R. Tetzlaff, Prof. F. Corinto, and Prof. D. Ielmini at IEEE MetroXRaine in Milan over the time span 25-27 October 2023.

Consult <https://metroxraine.org/special-session-16> for additional informations.

The 2023 edition of NOLTA is organized by Prof. A. Buscarino between the 26th and the 29th of September in Catania (Italy), as reported in the website <https://nolta2023.org>

The 2023 edition of MEMRISYS shall be organized in Turin (Italy) by Profs. F. Corinto, D. Ielmini, S. Spiga, and Carlo Ricciardi from the 5th to the 9th of November this year. Refer to <https://memrisys2023.polito.it/program/> for add-on details.

Profs. F. Corinto, M. Gilli, and R. Tetzlaff shall organize the 2023 edition of IEEE ECCTD in Turin between the 9th and the 11th of November this year. Please consult the portal <https://ecctd2023.polito.it> for additional information.

Alon Ascoli, Chair of the IEEE CASS CNN-MAC TC

Monterey, May 23, 2023

Alon Ascoli