

## PROGRAM AT-A-GLANCE

<b>29/9/2021</b>		<b>"IEEE INT. WORKSHOP CNNA 2021"</b>
15.00 - 15.15		Opening Ceremony
15.15 - 16.30		General Track
<b>COFFEE BREAK</b>		
16.45 - 18.15		General Track
18.30 - 19.15		Keynote: prof Leon O. Chua " <i>Chua's Riddle and Edge of Chaos Kernel in Memristors: Solution to Galvani's 240-Year Old Excitability Puzzle</i> "

<b>30/9/2021</b>		<b>"IEEE INT. WORKSHOP CNNA 2021"</b>
9.00 - 9.40		Keynote: prof Luigi Fortuna " <i>The impact of Cellular Nonlinear Networks in a Scientific Community: the case of the Etna Valley</i> "
<b>COFFEE BREAK</b>		
10.00 - 12.00		General Track
12.15 - 13.15		General Track
<b>LUNCH BREAK</b>		
14.30 - 15.15		Keynote: dr Chai Wah Wu " <i>Memristive Cellular Analog Arrays for Numerical Computation</i> "
15.30 - 16.00		Special Session Opening prof. J.P. Strachan
16.00 - 17.00		Special Session "Memristive and Memristor Symposium" - Part I
<b>COFFEE BREAK</b>		
17.15- 17.45		Special Session Invited prof Daniele Ielmini
17.45 - 19.15		Special Session "Memristive and Memristor Symposium" - Part II

<b>10/01/2021</b>		
9.00-9.40		Keynote: prof Ronald Tetzlaff " <i>Complex dynamics in memristive computing arrays</i> "
<b>COFFEE BREAK</b>		
<b>"7th MEMRISTOR and MEMRISTIVE SYMPOSIUM "</b>		
10.15-12.15		Symposium Lectures - Part I
<b>LUNCH BREAK</b>		
13.00 - 14.30		<b>IEEE CNN-MAC Technical Meeting</b>
14.45 - 17.15		Symposium Lectures - Part II
<b>COFFEE BREAK</b>		
17.30-19.00		Round Table

September 29th, 2021

15.00 – 15.15 Opening Ceremony

**15.15 – 16.30 General track**

- Attila Fejér, Zoltán Nagy, Jenny Benois-Pineau, Péter Szolgay, Aymar de Rugy and Jean-Philippe Domenge, *Array computing based system for visual servoing of neuroprosthesis of upper limbs*
- Elif Öztürk, İlayda Köseoğlu and Mustak Erhan Yalcin, *A Triangular Systolic Array Based Digital Architecture for Computing Eigenvalues of Asymmetric Matrix*
- Miklos Koller, Marcell Simko and Barnabas Garay, *Heteroclinic cycles in Chua--Yang ring networks*
- Szabolcs Kun and Peter Bauer, *Improvements in Optical Flow-based Aircraft Partial State Estimation*
- Angela Slavova and Ventsislav Ignatov, *Pattern Formation in CNN Working on the Edge of Chaos*

**16.45 – 18.15 General track**

- Francesco Marrone, Gianluca Zoppo, Luca Vescovi, Filippo Begarani, Ada Palamà, Jacopo Secco and Fernando Corinto, *Automatic Visual Inspection Machine for Pharmaceutical Infusion Bags Implementing Cellular Neural Networks*
- András Horváth, *On The Resilience of Cellular Neural Networks to Low-intensity Adversarial Attacks*
- Laurie Bose, Piotr Dudek, Jianing Chen and Stephen Carey, *Sand Castle Summation For Pixel Processor Arrays*
- Francesco De Lellis, Fabrizia Auletta, Giovanni Russo, Pietro De Lellis and Mario di Bernardo, *An Application of Control-Tutored Reinforcement Learning to the Herding Problem*
- Gabriele Manganaro, *Another look at Cellular Neural Networks*
- Luis Antonio Panes-Ruiz, Bergoı Ibarlucea, Eunhye Baek, Sangwook Park, Chang Ki Baek, Xinliang Feng and Gianaurelio Cuniberti, *Neuromorphic hybrid systems based on polarizable thin film-coated silicon nanowire field-effect transistors*

18.30 – 19.15 Keynote: Leon O. Chua, ***Chua's Riddle and Edge of Chaos Kernel in Memristors: Solution to Galvani's 240-Year Old Excitability Puzzle***

September 30th, 2021

09.00 – 09.40 Keynote: Luigi Fortuna, ***The impact of Cellular Nonlinear Networks in a Scientific Community: the case of the Etna Valley***

10.00 – 12.00 General track

- Kohei Nakata and Hiroyuki Torikai,  
*Analysis of time series classification of a multi-layer reservoir neural network based on asynchronous cellular automaton neurons with transmission delays*
- Hotaka Udagawa and Toshimichi Saito,  
*Analysis of Periodic Orbits in Cellular Binary Neural Networks*
- Takumi Suzuki and Toshimichi Saito,  
*Synthesis of Three-Layer Dynamic Binary Neural Networks for Control of Hexapod Walking Robots*
- Naoto Horie and Hiroyuki Torikai,  
*A novel hardware-efficient asynchronous cellular automaton model of tumor immunotherapy and its FPGA implementation*
- Itsuki Kubota and Hiroyuki Torikai,  
*A Novel Hardware-Efficient Cochlea Model based on Asynchronous Cellular Automaton Dynamics: Two-tone Suppression and FPGA Implementation*
- Hunor Laczko, Balint Janossy and Tamas Zsedrovits,  
*Towards 3D Cave Mapping with UAVs*
- Irene Mazzilli, Gianmario Mirabile, Paolo Lino, Guido Maione, Alexsey Rybakov, Ileana Blanco, Luigi De Bellis and Andrea Luvisi,  
*UAV Inspection of Olive Trees for the Detection of Xylella Fastidiosa Disease Using Neural Networks*
- Paolo Arena, Luca Patanè, Angelo Giuseppe Spinosa and Giuseppe Sutera,  
*A bio-inspired locomotion control approach through synchronization of embodied neural oscillators*

12.15 – 13.15 General track

- Levente Márk Sántha, Zoltán Nagy, Andras Kiss and György Csaba,  
*Comparing Different PC and FPGA Implementation Possibilities of Fast Multipole Method*
- Claudia Corradino, Eleonora Amato, Federica Torrisi and Ciro Del Negro,  
*Towards an automatic generalized machine learning approach to map lava flows*
- Mate Petho and Tamas Zsedrovits,  
*UAV obstacle detection with bio-motivated computer vision*
- Dafydd Ravenscroft and Luigi Occhipinti  
*2D Material Memristor Devices for Neuromorphic Computing*

14.30 – 15.15 Keynote: Chai Wah Wu, ***Memristive Cellular Analog Arrays for Numerical Computation***

### **Special Session "Memristive and Memristor Symposium"- Part I**

**15.30 – 16.00** Special Session Opening: John Paul Strachan, *In-memory computing with memristive devices for machine learning applications*

**16.00 – 17.00** Special Session I

- Tien Van Nguyen and Kyeong-Sik Min, *Defect-Resilient Technique of Memristor Crossbar with Large On-Off Ratio for Implementing HTM Spatial Pooler in Near-IoT-Sensor Cognition*
- Valeri Mladenov and Stoyan Kirilov, *A Neural Synapse Based on Ta2O5 Memristor*
- Stephan Menzel, Christopher Bengel, Johannes Mohr, Stefan Wiefels, Felix Cüppers, Susanne Hoffmann-Eifert and Dirk Wouters, *Reliability Aspects of Memristive Devices for Computing-in-Memory Applications*
- Theodoros Panagiotis Chatzinikolaou, Iosif-Angelos Fyrigos, Vasileios G. Ntinis, Stavros Kitsios, Panagiotis Bousoulas, Michail-Antisthenis I. Tsompanas, Dimitris Tsoukalas and Georgios Ch. Sirakoulis, *Memristive Oscillatory Networks for Computing: The Chemical Wave Propagation Paradigm*

### **Special Session "Memristive and Memristor Symposium"- Part II**

**17.15 – 17.45** Special Session Invited: D. Ielmini, *Analogue in-memory computing: status and outlook*

**17.45 – 19.15** Special Session II

- Manfred Hild, Maximilian Tolksdorf and Benjamin Panreck, *Breaking the Sensorimotor Loop – A Memristor-Ready Robot Control Architecture*
- Mauro Di Marco, Mauro Forti, Giacomo Innocenti and Alberto Tesi, *On controlling multistability in memristor circuits*
- Ludovico Minati, Lucia Valentina Gambuzza, Wesley J. Thio, Clinton Sprott and Mattia Frasca, *Chaotic circuit based on physical memristor*
- Mohamad Moner Al Chawa, Rodrigo Picos, Luis Antonio Panes-Ruiz, Leif Riemenschneider, Bergo Ibarlucea, Gianauelio Cuniberti and Ronald Tetzlaff, *Gas Sensing Discrimination using a Cellular Nonlinear Network*
- Ahmet Samil Demirkol, Alon Ascoli and Ronald Tetzlaff, *Mathematical Investigation of Static Pattern Formation with a Locally Active Memristor Model*
- Theodoros Panagiotis Chatzinikolaou, Iosif-Angelos Fyrigos, Vasileios Ntinis, Stavros Kitsios, Panagiotis Bousoulas, Michail-Antisthenis Tsompanas, Dimitris Tsoukalas and Georgios Ch. Sirakoulis, *Multifunctional Spatially-Expanded Logic Gate for Unconventional Computations with Memristor-Based Oscillators*

**October 1st, 2021**

09.00 – 09.40 Keynote: Ronald Tetzlaff, *Complex dynamics in memristive computing arrays*

### **7th MEMRISTOR and MEMRISTIVE SYMPOSIUM**

10.15 – 12.15 Symposium Part I (30 mins slots)

- R. S. Williams,  
*Decision Trees in Molecular Memristor*
- R. Waser,  
*Redox-based Memristive Switches for Neuromorphic Computing - In-Memory Binary Vector–Matrix Multiplication Based on Complementary Resistive Switches*
- Q. Xia,  
*3D Memristive Convolutional Neural Networks and Memristive Cellular Neural Networks*
- Alon Ascoli, Ahmet Samil Demirkol, Ronald Tetzlaff and Leon Chua,  
*Exploration of Edge of Chaos in Bio-Inspired Devices, Circuits, and Systems*

13.00-14.30 **IEEE CNN MAC - TC Meeting**

14.45 – 17.15 Symposium Part II

- Shahar Kvatinsky,  
*Making Real Memristive Processing-in-Memory Faster and Reliable*
- Steve Kang,  
*Memristor Neurons and Synapses, and Future On-Chip Integration for Brain-Scale Neuromorphic Computing*
- Thomas Mikolajick, Melanie Herzig, Stefan Slesazek, Martin Weiher, Alon Ascoli and Ronald Tetzlaff,  
*Optimization and Application of Niobium Oxide based Memristive NDR devices*
- Gianluca Zoppo, Francesco Marrone, Keyong-Sik Min, Fernando Corinto,  
*Energy--Based Machine Learning for Vision Systems exploiting Memristor Crossbar*
- J.J. Yang,  
*Timing Selector: using transient switching dynamics to solve the sneak path issue of crossbar arrays*

17.30 – 19.00 **Round Table**. Panelist: John Paul Strachan, Ronald Tetzlaff, Steve Kang, Rainer Waser, Thomas Mikolajick, J.J. Yang, Q. Xia.