

**Wednesday, September 7**

**Poster Session I (17:40-18:40)**

the poster session opens at 16:30

**Cryogenic CMOS readout for spin qubits**

M. Castriotta<sup>1</sup>, G. Guiducci<sup>1</sup>, E. Prati<sup>2,3</sup>, G. Ferrari<sup>4</sup>

<sup>1</sup> Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Milano, Italy

<sup>2</sup> Istituto di Fotonica e Nanotecnologie, Consiglio Nazionale delle Ricerche, Italy

<sup>3</sup> Dipartimento di Fisica, Università degli studi di Milano, Milano, Italy

<sup>4</sup> Dipartimento di Fisica, Politecnico di Milano, Milano, Italy

**Microwave Cryogenic Inkjet-Printed Electronics**

G. Crupi<sup>1</sup> and N. Donato<sup>2</sup>

<sup>1</sup> BIOMORF Department, University of Messina, Messina, Italy

<sup>2</sup> Engineering Department, University of Messina, Messina, Italy

**Approximate Recursive Multipliers**

E. Zacharelos<sup>1</sup>, G. Saggese<sup>1</sup>, I. Nunziata<sup>1</sup>, A. G.M. Strollo<sup>1</sup>, E. Napoli<sup>2</sup>

<sup>1</sup> Dept. of Electrical Engineering and Information Technology, University of Naples Federico II, Naples, Italy

<sup>2</sup> Dept. of Information and Electrical Engineering and Applied Mathematics, University of Salerno, Fisciano, Italy

**A Highly Stable CMOS PUF Based on a 4-Transistor Subthreshold Voltage Divider**

M. Vatalaro, R. De Rose, M. Lanuzza, F. Crupi

DIMES, University of Calabria, Rende 87036, Italy

**Design of Micro Antennas for Package Scale Galvanic Isolators based on RF Planar Coupling**

S. Spataro and E. Ragonese

Dipartimento di Ingegneria Elettrica Elettronica e Informatica (DIEEI) DIEEI), Università di Catania

**Transport simulations of metal-MoS<sub>2</sub> contacts**

D. Lizzit<sup>1</sup>, F. Driussi<sup>1</sup>, P. Khakbaz<sup>1</sup>, M. Pala<sup>2</sup>, D. Esseni<sup>1</sup>

<sup>1</sup> DPIA, Università degli Studi di Udine, Udine, Italy

<sup>2</sup> Université Paris-Saclay, CNRS, Palaiseau, France

**Flexible Passive Sensor Patch with Contactless Readout for Measurement of Human Body Temperature**

M. Zini, M. Baù, A. Nastro, M. Ferrari, V. Ferrari

Department of Information Engineering, University of Brescia, 25123 Brescia, Italy

**Closed-loop in-memory computing for 6G massive MIMO acceleration**

P. Mannocci, G. Pedretti, F. Sancandi, V. Pelleriti, C. Villa, D. Ielmini

Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano and IUNET, piazza L. da Vinci 32, 20133 Milan, Italy

**Low area energy efficient implementations for the DLMS Adaptive Filter with low steady state error**

G. Di Meo, D. De Caro, N. Petra, A.G.M. Strollo

Department of Information Technology and Electrical Engineering (DIETI), University of Naples Federico II, Naples, Italy

**Radar sensor system for unobtrusive level monitoring of granular solids stored in silos**

M. Zini<sup>1</sup>, M. Baù<sup>1</sup>, F. Scubla<sup>2</sup>, M. Loda<sup>2</sup>, G. Stefini<sup>2</sup>, A. Nastro<sup>1</sup>, M. Ferrari<sup>1</sup>, V. Ferrari<sup>1</sup>

<sup>1</sup> Department of Information Engineering, University of Brescia, Brescia, Italy

<sup>2</sup> Invisiblefarm S.r.l., Brescia, Italy

**Electrolyte-gated carbon nanotube field-effect transistor-based biosensors**

M. Petrelli, B. Shkodra, M.A. Costa Angeli, P. Lugli and L. Petti

Faculty of Science and Technologies, Free University of Bozen-Bolzano, Bolzano, Italy

**Readout electronics concept for innovative THz hyperspectral imaging detector**

L. Gregorat<sup>1</sup>, D. Marchese<sup>1</sup>, M. Cautero<sup>1</sup>, S. Carrato<sup>1</sup>, G. Cautero<sup>2</sup>, M. Lazzarino<sup>3</sup>, A. Pitanti<sup>4</sup>, L. Vicarelli<sup>4</sup>, S. Roddaro<sup>4,5</sup>

<sup>1</sup> Dipartimento di Ingegneria e Architettura, Università degli Studi di Trieste, Trieste, Italy

<sup>2</sup> Laboratorio Strumentazione e Detectors, Elettra Sincrotrone Trieste, Trieste, Italy

<sup>3</sup> CNR-IOM, Trieste, Italy

<sup>4</sup> Laboratorio NEST, Scuola Normale Superiore e Istituto Nanoscienze - CNR, Pisa, Italy

<sup>5</sup> Dipartimento di Fisica, Università di Pisa, Pisa, Italy

**Advanced modeling of trapping/de trapping noise in nanoscale MOSFETs**

R. Asanovski<sup>1</sup>, P. Palestri<sup>2</sup> and L. Selmi<sup>1</sup>

<sup>1</sup> DIEF, Università di Modena e Reggio Emilia, MO, Italy

<sup>2</sup> DPIA, Università degli Studi di Udine, Udine, Italy

**The Dickson Charge Pump as a Signal Amplifier**

A. Ballo, A. D. Grasso and G. Palumbo

Dipartimento di Ingegneria Elettrica, Elettronica e Informatica (DIEEI), University of Catania, Catania, Italy

**Early diagnosis of viral infections by Differential Impedance Sensing platform**

P. Piedimonte<sup>1</sup>, C. de Oliveira Figares<sup>1</sup>, L. Sola<sup>2</sup>, M. Chiari<sup>2</sup>, G. Ferrari<sup>1</sup> and M. Sampietro<sup>1</sup>

<sup>1</sup> Department of Electronics, Information and Bioengineering, Politecnico di Milano, Milan, Italy

<sup>2</sup> Istituto di Scienze e Tecnologie Chimiche, National Research Council, Milan, Italy

**New lab of Electronics at Ca Foscari**

G. A. Salvatore and D. De Fazio

Department of Molecular Science and Nanosystems, University of Venice Ca Foscari, Venice, Italy

**US-Powered Communication and Power Delivery ICs for Implantable Medical Devices in 28-nm bulk CMOS Technology**

M. Privitera, A. Ballo, A. D. Grasso

Department of Electric, Electronics and Computer Science Engineering, University of Catania

**The Sparse Readout RIGEL Application Specific Integrated Circuit for X-ray PixDD Detector**

I. Dedolli<sup>1</sup>, F. Mele<sup>1</sup>, M. Gandola<sup>1</sup>, M. Grassi<sup>2</sup>, F. Ceraudo<sup>3</sup>, R. Campana<sup>4</sup>, M. Fiorini<sup>5</sup>, M. Feroci<sup>3</sup>, P. Malcovati<sup>2</sup>, G. Bertuccio<sup>1</sup>

<sup>1</sup> Politecnico di Milano, Como, Italy

<sup>2</sup> Università degli Studi di Pavia, Pavia, Italy

<sup>3</sup> INAF-IAPS, Rome, Italy

<sup>4</sup> INAF-OAS, Bologna, Italy

<sup>5</sup> INAF, Milan, Italy

## **Compliant, Ultra Compact Micro- and Nanogrippers for Biomedical Applications**

A. Buzzin<sup>1</sup>, G. de Cesare<sup>1</sup>, N. P. Belfiore<sup>2</sup>

<sup>1</sup> Department of Information Engineering, Electronics and Telecommunications, Sapienza University of Rome, Rome, Italy

<sup>2</sup> Department of Engineering, Università degli Studi di Roma Tre, Rome, Italy

## **Content-Addressable Memory for Approximate Matching Applications in Genome Analysis**

E. Garzón and M. Lanuzza

DIMES, University of Calabria, Rende 87036, Italy

## **Efficiency enhancement of CMOS photodetectors by direct integration of plasmonic nanostructures**

E. Scattolo<sup>1,2</sup>, A. Cian<sup>1</sup>, L. Petti<sup>2</sup>, P. Lugli<sup>2</sup>, D. Giubertoni<sup>1</sup>, G. Paternoster<sup>1</sup>

<sup>1</sup> Sensors and Devices Center, Bruno Kessler Foundation, Trento, I-38123, Italy

<sup>2</sup> Sensing Technologies Lab, Free university of Bozen, 39100 Bolzano BZ, Italy

## **Stability analysis of linear and nonlinear circuits**

S. Colangeli, A. Serino, W. Ciccognani, P.E. Longhi, E. Limiti

Electronic Engineering Department, Università di Roma "Tor Vergata", Rome, Italy

## **GaN Integrated Circuits for Smart Power Applications**

K. Samperi<sup>1</sup>, F. Pulvirenti<sup>2</sup>, N. Spina<sup>2</sup>, S. Pennisi<sup>1</sup>, G. Palmisano<sup>1</sup>

<sup>1</sup> Department of Electrical, Electronics and Computer Engineering (DIEEI) - University of Catania, Catania, 95125, Italy

<sup>2</sup> STMicroelectronics, Catania, Italy

## **Application of PMUTs for Data Communication & Low Power Ultrasound Anemometer**

S. Sanvito<sup>1,2</sup>, M. Passoni<sup>2</sup>, G. Traversi<sup>1</sup>

<sup>1</sup> Department of Engineering and Applied Science, University of Bergamo, Dalmine, Italy

<sup>2</sup> STMicroelectronics, Agrate, Italy

## **PROMET&O: A Multidisciplinary Approach to Monitor Indoor Environmental Quality**

A. Barbaro<sup>1</sup>, V. Fissore<sup>2</sup>, E. Raviola<sup>1</sup>, G.E. Puglisi<sup>2</sup>, P. Chiavassa<sup>3</sup>, E. Giusto<sup>3</sup>, A. Astolfi<sup>2</sup>, A. Servetti<sup>3</sup>, B. Montrucchio<sup>3</sup>, F. Fiori<sup>1</sup>, N. Sassoli<sup>4</sup>

<sup>1</sup> Electronics and Telecom. Dpt. (DET), Politecnico di Torino, Turin, Italy

<sup>2</sup> Energy Dpt. (DENERG), Politecnico di Torino, Turin, Italy

<sup>3</sup> Control and Computer Engineering Dpt. (DAUIN), Politecnico di Torino, Turin, Italy

<sup>4</sup> Seaside S.p.A., Gruppo Italgas, Bologna, Italy

## **A mixed-mode simulation framework to investigate neuronal signal transduction and sensing at nanoelectrodes**

F. Leva<sup>1</sup>, P. Palestri<sup>2</sup>, L. Selmi<sup>1</sup>

<sup>1</sup> Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy

<sup>2</sup> Polytechnique Department of Engineering and Architecture, University of Udine, Udine, Italy

## Thursday, September 8

### Oral Session I (9:10-10:30)

9:10-9:30	<b>A 0.3V Three-Stage Body-Driven OTA</b> <u>R. Della Sala</u> , F. Centurelli, P. Monsurrò, G. Scotti and A. Trifiletti DIET, Sapienza Università di Roma, Roma, Italy
9:30-9:50	<b>300-mV Bulk-Driven Three-Stage OTA in 65-nm CMOS</b> A. Ballo <sup>1</sup> , <u>A. D. Grasso</u> <sup>1</sup> , S. Pennisi <sup>1</sup> , G. Susinni <sup>2</sup> <sup>1</sup> Dipartimento di Ingegneria Elettrica, Elettronica e Informatica (DIEEI), University of Catania, Catania, Italy <sup>2</sup> EDA INDUSTRIES S.P.A., Catania, Italy
9:50-10:10	<b>TCAD Modeling of high-field electron transport in bulk wurtzite GaN: the full-band SHE-BTE</b> <u>L. Balestra</u> , L. Vezzali, E. Gnani, S. Reggiani ARCES and DEI, University of Bologna, Viale Risorgimento, 2, Bologna, Italy
10:10-10:15	<b>A Reconfigurable Multiplier/Dot-Product Unit for Precision-Scalable Deep Learning Applications</b> <u>L. Urbinati</u> and M. R. Casu Dept. of Electronics and Telecommunications, Politecnico di Torino, 10129 Torino, Italy
10:15-10:20	<b>Flexible and Transparent Thin-Film Transistors, Analog Circuits and Digital Ports</b> <u>G. Cantarella</u> , F. Catania, D. Corsino, N. Münzenrieder Faculty of Science and Technology, Free University of Bozen-Bolzano, Bolzano, 39100, Italy
10:20-10:25	<b>In-memory computing with crosspoint resistive memory arrays for machine learning</b> <u>S. Ricci</u> , P. Mannocci, M. Farronato, D. Ielmini Dipartimento di Elettronica, Informazione e Bioingegneria (DEIB), Politecnico di Milano and IUNET, Milano 20133, Italy
10:25-10:30	<b>Harmonic Wireless Sensors based on Polarization Diversity Transmissions</b> G. Schiavolini, G. Simoncini, G. Cicioni, R. Salvati, V. Palazzi, G. Orecchini, P. Mezzanotte, L. Roselli, <u>F. Alimenti</u> Department of Engineering, University of Perugia, Perugia, Italy
<b>Oral Session II (11:00-13:00)</b>	
11:00-11:20	<b>A Broadband Doherty Power Amplifier for Sub-6 5G Applications</b> M. Shahmordi <sup>1</sup> , S.-H. Javid-Hosseini <sup>1</sup> , V. Nayyeri <sup>1</sup> , R. Giofrè <sup>2</sup> , <u>P. Colantonio</u> <sup>2</sup> <sup>1</sup> School of Advanced Technologies, Iran University of Science and Technology, Tehran, Iran <sup>2</sup> Electronic Engineering Department, University of Roma Tor Vergata, Roma, Italy
11:20-11:40	<b>Low-Noise Amplifiers in Gallium Nitride for robust and highly linear Ka-band SATCOM</b> P. E. Longhi, L. Pace, <u>S. Colangeli</u> , W. Ciccognani, E. Limiti Electronic Engineering Department, Università Roma "Tor Vergata", Rome, Italy

11:40-12:00	<p><b>Accelerometric system based on a fully FDM 3D printed sensor</b></p> <p><u>G. Barile</u>, L. Iacoboni, V. Stornelli, G. Ferri</p> <p>Dept. of Industrial and Information Engineering and Economics, University of L'Aquila, 67100, L'Aquila, Italy</p>
12:00-12:20	<p><b>A 0.8 mW tinyML based PDM-to-PCM conversion for In-Sensor KWS applications</b></p> <p><u>P. Vitolo</u><sup>1</sup>, R. Liguori<sup>1</sup>, L. Di Benedetto<sup>1</sup>, A. Rubino<sup>1</sup>, D. Pau<sup>2</sup>, G. D. Licciardo<sup>1</sup></p> <p><sup>1</sup> Department of Industrial Engineering, University of Salerno, Fisciano, Italy</p> <p><sup>2</sup> System Research and Applications, STMicroelectronics, Agrate Brianza, Italy</p>
12:20-12:40	<p><b>Flexural Plate Wave Piezoelectric MEMS Transducer for Cell Alignment in Aqueous Solution</b></p> <p><u>A. Nastro</u><sup>1</sup>, M. Baù<sup>1</sup>, M. Ferrari<sup>1</sup>, L. Rufer<sup>2</sup>, S. Basrou<sup>2</sup>, V. Ferrari<sup>1</sup></p> <p><sup>1</sup> Department of Information Engineering, University of Brescia, 25123 Brescia, Italy</p> <p><sup>2</sup> CNRS, Grenoble INP, TIMA, University Grenoble Alpes, 38000 Grenoble, France</p>
12:40-12:45	<p><b>Multi-bias thermal X-parameter model for efficient physics-based FinFET simulation in RF CAD tools</b></p> <p><u>E. Catoggio</u>, S. Donati Guerrieri, C. Ramella, F. Bonani</p> <p>Department of Electronics and Telecommunications, Politecnico di Torino, Torino, Italy</p>
12:45-12:50	<p><b>Modular IoT Unit to Monitor Water Distribution with an Impedance Leak Sensor</b></p> <p>C. Riboldi, D. M. Crafa, <u>M. Carminati</u></p> <p>Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Milano, Italy</p>
12:50-12:55	<p><b>Wireless Harmonic Vibration Sensor based on Piezo-Varactor Direct Phase Modulation</b></p> <p><u>G. Simoncini</u>, G. Cicioni, R. Salvati, V. Palazzi, G. Schiavolini, G. Orecchini, F. Alimenti, P. Mezzanotte, L. Roselli</p> <p>Department of Engineering, University of Perugia, Perugia, Italy</p>
12:55-13:00	<p><b>Empirical Electrical Model of Amorphous Silicon Junction Field Effect Transistors for Electronics on Flexible Substrates</b></p> <p><u>N. Lovecchio</u>, D. Caputo, V. Ferrara, G. de Cesare</p> <p>Department of Information Engineering, Electronics and Telecommunications, Sapienza University of Rome, Rome, Italy</p>
<b>Poster Session II (9:10-13:00)</b>	
<p><b>RFID Transceiver for both Powering Implantable ECoG and Wireless Brain Signal Monitoring</b></p> <p><u>D. De Venuto</u><sup>1</sup> and J. Rabaey<sup>2</sup></p> <p><sup>1</sup> Department of Electrical and Information Engineering, Politecnico di Bari, Bari, Italy</p> <p><sup>2</sup> EECS UC Berkeley, USA</p>	
<p><b>The 32 analog channels readout for the long-flight GAPS balloon experiment tracking system</b></p> <p><u>E. Riceputi</u><sup>1</sup>, M. Boezio<sup>4</sup>, L. Fabris<sup>2</sup>, L. Ghislotti<sup>1</sup>, P. Lazzaroni<sup>1</sup>, M. Manghisoni<sup>1</sup>, L. Ratti<sup>3</sup>, V. Re<sup>1</sup>, G. Zampa<sup>4</sup></p> <p><sup>1</sup> Department of Engineering and Applied Science, University of Bergamo, Dalmine, Italy</p> <p><sup>2</sup> Oak Ridge National Laboratory, Oak Ridge, TN, USA</p> <p><sup>3</sup> Department of Electrical, Computer and Biomedical Engineering, University of Pavia, Pavia, Italy</p> <p><sup>4</sup> INFN, Trieste Division, Trieste, Italy</p>	

**A Reconfigurable Multiplier/Dot-Product Unit for Precision-Scalable Deep Learning Applications**

L. Urbinati and M. R. Casu

Dept. of Electronics and Telecommunications, Politecnico di Torino, 10129 Torino, Italy

**High-resolution, long-range Time-to-Digital Converter for Time-Correlated Single Photon Counting**

C. Nonne, F. Madonini, A. Maurina, F. Villa

Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Milano, Italy

**Flexible and Transparent Thin-Film Transistors, Analog Circuits and Digital Ports**

G. Cantarella, F. Catania, D. Corsino, N. Münzenrieder

Faculty of Science and Technology, Free University of Bozen-Bolzano, Bolzano, 39100, Italy

**In-memory computing with crosspoint resistive memory arrays for machine learning**

S. Ricci, P. Mannonci, M. Farronato, D. Ielmini

Dipartimento di Elettronica, Informazione e Bioingegneria (DEIB), Politecnico di Milano and IUNET, Milano 20133, Italy

**Microwave Radars for Automotive In-Cabin Detection**

E. Cardillo<sup>1</sup>, L. Ferro<sup>1</sup>, C. Li<sup>2</sup>, A. Caddemi<sup>1</sup>

<sup>1</sup> Department of Engineering, University of Messina, Messina, Italy

<sup>2</sup> Department of Electrical and Computer Engineering, Texas Tech University, Lubbock, TX, USA

**Analysis of a Single-Ended GaN-based Drain-Pumped Mixer for Radar Applications**

L. Pagnini, G. Collodi, A. Cidronali

Department of Information Engineering, University of Florence, Florence, Italy

**Harmonic Wireless Sensors based on Polarization Diversity Transmissions**

G. Schiavolini, G. Simoncini, G. Cicioni, R. Salvati, V. Palazzi, G. Orecchini, P. Mezzanotte, L. Roselli, F. Alimenti

Department of Engineering, University of Perugia, Perugia, Italy

**Parameterized surrogate models of microstrip structures for electromagnetic-based power amplifier design and statistical analysis**

C. Ramella, A. Zanco, M. De Stefano, T. Bradde, S. Grivet-Talocia, M. Pirola

Dept. Electronics and Telecommunications, Politecnico di Torino, Turin, Italy

**Multi-bias thermal X-parameter model for efficient physics-based FinFET simulation in RF CAD tools**

E. Catoggio, S. Donati Guerrieri, C. Ramella, F. Bonani

Department of Electronics and Telecommunications, Politecnico di Torino, Torino, Italy

**Modular IoT Unit to Monitor Water Distribution with an Impedance Leak Sensor**

C. Riboldi, D. M. Crafa, M. Carminati

Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Milano, Italy

**Wireless Harmonic Vibration Sensor based on Piezo-Varactor Direct Phase Modulation**

G. Simoncini, G. Cicioni, R. Salvati, V. Palazzi, G. Schiavolini, G. Orecchini, F. Alimenti, P. Mezzanotte, L. Roselli

Department of Engineering, University of Perugia, Perugia, Italy

### **Electrochemical biosensor for the detection of bacteriophage of *L. Lactis* for dairy industry**

S. Bonaldo<sup>1</sup>, S. Poggi<sup>1</sup>, L. Franchin<sup>1</sup>, E. Pasqualotto<sup>2</sup>, E. Cretaio<sup>2</sup>, A. Paccagnella<sup>1</sup>

<sup>1</sup> Department of Information Engineering, University of Padova, 35131 Padova, Italy

<sup>2</sup> ARCADIA s.r.l., 35132 Padova, Italy

### **Optically-induced dielectrophoresis platform as a potential tool to detect and analyze circulating tumor cells (CTCs)**

J. Filippi<sup>1,2</sup>, F. Corsi<sup>3</sup>, P. Casti<sup>2</sup>, G. Antonelli<sup>1,2</sup>, M. D'Orazio<sup>1,2</sup>, S. Cardarelli<sup>1,2</sup>, F. Capradossi<sup>3</sup>, R. Capuano<sup>1</sup>, C. Catini<sup>1</sup>, L. Ghibelli<sup>3</sup>, A. Mencattini<sup>1,2</sup>, C. Di Natale<sup>1</sup>, E. Martinelli<sup>1,2</sup>

<sup>1</sup> Department of Electronic Engineering, University of Rome Tor Vergata, 00133 Rome, Italy

<sup>2</sup> Interdisciplinary Center for Advanced Studies on Lab-on-Chip and Organ-on-Chip Applications (ICLOC), 00133 Rome, Italy

<sup>3</sup> Department of Biology, University of Rome Tor Vergata, 00133 Rome, Italy

### **Modelling and design of a ISFET-based NaCl sensor for cystic fibrosis diagnosis and management**

A. Ia Grasta, M. De Carlo, F. Dell'Olio, V. M. N. Passaro

Department of Electrical and Information Engineering, Polytechnic University of Bari

### **Development of VOCs Sensor Based on Synthetic Zeolite layers**

G. Oliva, A.S. Fiorillo, S.A. Pullano

BATS lab, Department of Health Sciences, Magna Graecia University of Catanzaro, Italy

### **AuNP-coated cotton as acetone-based VOC sensor for disease detection from breath**

S. Casalnuovo<sup>1</sup>, A. Buzzin<sup>1</sup>, D. Caschera<sup>2</sup>, S. Quaranta<sup>2</sup>, F. Federici<sup>2</sup>, L. Zortea<sup>3</sup>, A. Brotzu<sup>3</sup>, S. Natali<sup>3</sup>, D. Puglisi<sup>4</sup>, G. de Cesare<sup>1</sup>, D. Caputo<sup>1</sup>

<sup>1</sup> Dept. of Information Eng., Electronics and Telecommunications, Sapienza University, Rome, Italy

<sup>2</sup> Institute of nanostructured materials (ISMN), National Research Council, Rome, Italy

<sup>3</sup> Dept. of Chemical Eng. Materials & Environment, Sapienza University, Rome, Italy

<sup>4</sup> Dept. of Physics, Chemistry and Biology (IFM), Linköping University, Sweden

### **X-ray Detection with PbS Colloidal Quantum Dots**

A. De Iacovo<sup>1,2</sup>, M. Ruggieri<sup>1,2</sup>, A. Fabbri<sup>2</sup>, P. Branchini<sup>2</sup>, E. Marconi<sup>2,3</sup>, M. Naitana<sup>2,3</sup>, L. Tortora<sup>2,3</sup>, L. Colace<sup>1,2</sup>

<sup>1</sup> Department of Industrial, Electronic and Mechanical Engineering, Roma Tre University, Rome, Italy

<sup>2</sup> INFN – Roma Tre, Rome, Italy

<sup>3</sup> Department of Science, Roma Tre University, Rome, Italy

### **Toward Single-pulse Monitoring for FLASH Radiotherapy**

S. Pettinato<sup>1,2</sup>, M. Girolami<sup>2</sup>, M.C. Rossi<sup>3</sup>, D. Baretin<sup>1</sup>, S. Salvatori<sup>1,2</sup>

<sup>1</sup> Faculty of Engineering, Università degli Studi “Niccolò Cusano”, Rome, Italy

<sup>2</sup> Istituto di Struttura della Materia, Consiglio Nazionale delle Ricerche, Montelibretti (Rome), Italy

<sup>3</sup> Department of Industrial, Electronic and Mechanical Engineering, Università degli Studi Roma Tre, Rome, Italy

### **Empirical Electrical Model of Amorphous Silicon Junction Field Effect Transistors for Electronics on Flexible Substrates**

N. Lovecchio, D. Caputo, V. Ferrara, G. de Cesare

Department of Information Engineering, Electronics and Telecommunications, Sapienza University of Rome, Rome, Italy

### Oral Session III (14:30-16:30)

14:30-14:50	<p><b>Silicone embedded FBGs for force sensing</b></p> <p>P. Di Palma, <u>E. De Vita</u>, A. Iadicicco, S. Campopiano Department of Engineering, University of Naples “Parthenope”, Naples, Italy</p>
14:50-15:10	<p><b>Optical power screening effects in Ge-on-Si vertical <i>pin</i> photodetectors</b></p> <p><u>M. G. C. Alasio</u><sup>1</sup>, P. Franco<sup>1</sup>, A. Tibaldi<sup>1,2</sup>, F. Bertazzi<sup>1,2</sup>, S. Namnabat<sup>3</sup>, S. H. Ramachandra<sup>3</sup>, D. Adams<sup>3</sup>, P. Gothoskar<sup>3</sup>, G. Masini<sup>3</sup>, F. Forghieri<sup>3</sup>, G. Ghione<sup>1</sup>, M. Goano<sup>1,2</sup></p> <p><sup>1</sup> Dipartimento di Elettronica e Telecomunicazioni, Politecnico di Torino, 10129 Torino, Italy <sup>2</sup> IEIIT-CNR 10129 Torino, Italy <sup>3</sup> Cisco Systems, 7540 Windsor Drive, Suite 412, Allentown, PA 18195, USA</p>
15:10-15:30	<p><b>Dielectric Optical Fiber Meta-Tip for labeled biosensing</b></p> <p><u>M. Principe</u><sup>1</sup>, H. Alhalaby<sup>1,2</sup>, H. Zaraket<sup>2</sup>, P. Vaiano<sup>1</sup>, A. Aliberti<sup>1</sup>, G. Quero<sup>1</sup>, A. Crescitelli<sup>3</sup>, V. Di Meo<sup>3</sup>, E. Esposito<sup>3</sup>, M. Consales<sup>1</sup>, A. Cusano<sup>1</sup></p> <p><sup>1</sup> Engineering Department, University of Sannio, Benevento, Italy <sup>2</sup> Faculty of Sciences, Lebanese University, Beirut, Lebanon <sup>3</sup> Institute of Applied Sciences and Intelligent Systems, National Research Council, Napoli, Italy</p>
15:30-15:50	<p><b>FPGA HardWare Architecture for SVPWM based on a Taylor Series Decomposition</b></p> <p><u>A. Donisi</u>, L. Di Benedetto, R. Liguori, G.D. Licciardo, A. Rubino Dept. of Industrial Engineering, University of Salerno, Fisciano (SA), Italy</p>
15:50-16:10	<p><b>Modelling Non-Linearities of Power Electronic Converters using Artificial Neural Networks</b></p> <p>A. Zilio, <u>D. Biadene</u>, T. Caldognetto, P. Mattavelli Department of Management and Engineering, University of Padova, Vicenza, Italy</p>
16:10-16:15	<p><b>A new way of using Plasmonic phenomena in optical fibers to realize highly sensitive Sensors: what prospects?</b></p> <p>N. Cennamo, <u>F. Arcadio</u>, D. Del Prete, L. Zeni Department of Engineering, University of Campania Luigi Vanvitelli, Aversa, Italy</p>
16:15-16:20	<p><b>All-Optical Biophotonic and Microfluidic Circuits for Photo-thermal Applications</b></p> <p>C. Santini<sup>1</sup>, L. De Sio<sup>2</sup>, F. Petronella<sup>3</sup>, <u>A. d’Alessandro</u><sup>1</sup></p> <p><sup>1</sup> Department of Information Engineering, Electronics and Telecommunications, Sapienza University, Rome, Italy <sup>2</sup> Department of Medico-Surgical Sciences and Biotechnologies, Center for Biophotonics, Sapienza University, Rome, Italy <sup>3</sup> Institute of Crystallography, National Research Council, Monterotondo, Italy</p>
16:20-16:25	<p><b>Protein A denaturation sensing through Surface Enhanced InfraRed Absorption (SEIRA) spectroscopy</b></p> <p><u>V. Di Meo</u><sup>1</sup>, M. Moccia<sup>2</sup>, G. Sanità<sup>1</sup>, A. Crescitelli<sup>1</sup>, A. Lamberti<sup>3</sup>, V. Galdi<sup>2</sup>, I. Rendina<sup>1</sup>, E. Esposito<sup>1</sup></p> <p><sup>1</sup> Institute of Applied Sciences and Intelligent Systems – Unit of Naples, National Research Council, Naples, Italy <sup>2</sup> Fields &amp; Waves Lab, Department of Engineering, University of Sannio, Benevento, Italy <sup>3</sup> Department of Molecular Medicine and Medical Biotechnology, University of Naples Federico II, Naples, Italy</p>



16:25-16:30	<p><b>140 GHz Bandwidth Electro-Optical Modulator for FO Links based on a-Si:H/Graphene/c-Si Stacks</b></p> <p><u>E. D. Mallema</u><sup>1</sup>, M. Casalino<sup>2</sup>, C. Porcaro<sup>1</sup>, S. Rao<sup>1</sup>, F. G. Della Corte<sup>3</sup></p> <p><sup>1</sup> Dept. DIIES, University Mediterranea of Reggio Calabria, Reggio Calabria, Italy  <sup>2</sup> Institute ISASI, National Research Council (CNR), Naples, Italy  <sup>3</sup> Dept. DIETI, University of Naples Federico II, 80125 Naples, Italy</p>
<b>Oral Session IV (17:00-18:20)</b>	
17:00-17:20	<p><b>Scalable Design Space Exploration for the Synthesis of Redundant Architectures</b></p> <p>A. Tierno<sup>1</sup>, G. Turri<sup>2</sup>, A. Cimatti<sup>2</sup>, <u>R. Passerone</u><sup>1</sup></p> <p><sup>1</sup> DISI, University of Trento, Trento, Italy  <sup>2</sup> Embedded Systems, Fondazione Bruno Kessler, Trento, Italy</p>
17:20-17:40	<p><b>Improving SET Fault Resilience by exploiting Buffered DMR microarchitecture</b></p> <p><u>M. Barbirotta</u>, A. Mastrandrea, A. Cheikh, F. Menichelli, M. Olivieri</p> <p>Sapienza University of Rome, Italy</p>
17:40-18:00	<p><b>Batteryless Soil EIS Sensor Powered by Microbial Fuel Cell</b></p> <p>A. Torrisi, M. Doglioni, L. Santoro, L. Gemma, A. Albanese, M. Nardello, <u>D. Brunelli</u></p> <p>Department of Industrial Engineering, University of Trento, Trento, Italy</p>
18:00-18:05	<p><b>Designing power systems to charge electrical vehicle fleets in the industrial environment</b></p> <p><u>A.A. Nkemb</u>i, M. Simonazzi, D. Santoro, P. Cova, R. Menozzi, N. Delmonte</p> <p>Department of Engineering and Architecture, University of Parma, Italy</p>
18:05-18:10	<p><b>GaN-based Isolated Resonant Converters operating in the MHz Range: a Comparative Study</b></p> <p><u>S. Cabizza</u> and G. Spiazzi</p> <p>Department of Information Engineering, University of Padova, Italy</p>
18:10-18:15	<p><b>Explaining a Deep Reinforcement Learning (DRL) Based Automated Driving Agent in Highway Simulations</b></p> <p>F. Bellotti, R. Berta, A. Capello, M. Cossu, A. De Gloria, S. Maestri, <u>L. Lazzaroni</u></p> <p>DITEN, Università degli Studi di Genova, Genova, Italy</p>
18:15-18:20	<p><b>Telemonitoring and remote control IoT system of phytosanitary products in agricultural machinery</b></p> <p>L. Lucangeli<sup>1,2</sup>, E. D'Angelantonio<sup>1,2</sup>, <u>A. Pallotti</u><sup>1,3,4</sup></p> <p><sup>1</sup> Technoscience - Parco Scientifico e Tecnologico Pontino, Latina, 04100, Italy  <sup>2</sup> University of Rome "Foro Italico", Rome, 00135, Italy  <sup>3</sup> University of Rome "San Raffaele", Rome, 00166, Italy  <sup>4</sup> University of Rome "Tor Vergata", Rome, 00133, Italy</p>

## Poster Session III (14:30-18:30)

### Lab-on-Fiber Technology: Toward Advanced Photonic Platforms for Therapy in Oncology

T. M. Caputo<sup>1,2</sup>, G.M. Berruti<sup>1</sup>, S. Principe<sup>2</sup>, M. Giaquinto<sup>1</sup>, A. Aliberti<sup>1</sup>, A. M. Cusano<sup>2</sup>, P. Cicatiello, C. Mulè<sup>1</sup>, G. Quero<sup>1</sup>, P. Vaiano<sup>1</sup>, A. Boniello<sup>2</sup>, A. Micco<sup>2</sup>, A. Ricciardi<sup>1</sup>, M. Consales<sup>1,2</sup>, A. Cusano<sup>1,2</sup>

<sup>1</sup> Engineering Department, University of Sannio, Benevento, Italy

<sup>2</sup> Centro Regionale Information Communication Technology - CeRICT srl, Benevento, Italy

### Optoelectronics on fiber: towards all-in-fiber autonomous optrodes

A. Ricciardi<sup>1</sup>, M. Zimmer<sup>2</sup>, N. Witz<sup>2</sup>, A. Micco<sup>1</sup>, F. Piccirillo<sup>1</sup>, M. Giaquinto<sup>1</sup>, M. Kaschel<sup>3</sup>, J. Burghartz<sup>3</sup>, M. Jetter<sup>2</sup>, P. Michler<sup>2</sup>, S. L. Portalupi<sup>2</sup>, A. Cusano<sup>1</sup>

<sup>1</sup> Optoelectronics Group, Department of Engineering, University of Sannio, I-82100, Benevento, Italy

<sup>2</sup> Institut für Halbleiteroptik und Funktionelle Grenzflächen, Center for Integrated Quantum Science and Technology (IQST) and SCoPE, University of Stuttgart, Allmandring 3, 70569, Stuttgart, Germany

<sup>3</sup> Institut für Mikroelektronik Stuttgart (IMS CHIPS), 70569 Stuttgart, Germany

### A new way of using Plasmonic phenomena in optical fibers to realize highly sensitive Sensors: what prospects?

N. Cennamo, F. Arcadio, D. Del Prete, L. Zeni

Department of Engineering, University of Campania Luigi Vanvitelli, Aversa, Italy

### Gamma irradiation and recovery effects on optical fibers investigated by Long Period Grating

F. Esposito<sup>1</sup>, A. Stancalie<sup>2</sup>, A. Srivastava<sup>1</sup>, M. Śmietana<sup>3</sup>, R. Mihalcea<sup>2</sup>, C.D. Neguț<sup>4</sup>, S. Campopiano<sup>1</sup>, A. Iadicco<sup>1</sup>

<sup>1</sup> Department of Engineering, University of Naples "Parthenope", Naples, Italy

<sup>2</sup> CETAL, National Institute Laser, Plasma and Radiation Physics, Magurele, Romania

<sup>3</sup> Institute of Microelectronics and Optoelectronics, Warsaw University of Technology, Warsaw, Poland

<sup>4</sup> Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering, Magurele, Romania

### All-Optical Biophotonic and Microfluidic Circuits for Photo-thermal Applications

C. Santini<sup>1</sup>, L. De Sio<sup>2</sup>, F. Petronella<sup>3</sup>, A. d'Alessandro<sup>1</sup>

<sup>1</sup> Department of Information Engineering, Electronics and Telecommunications, Sapienza University, Rome, Italy

<sup>2</sup> Department of Medico-Surgical Sciences and Biotechnologies, Center for Biophotonics, Sapienza University, Rome, Italy

<sup>3</sup> Institute of Crystallography, National Research Council, Monterotondo, Italy

### Dynamic and high-resolution strain measurements using the Brillouin Optical Frequency-Domain Analysis

E. Catalano<sup>1</sup>, R. Vallifuoco<sup>1</sup>, R. Bernini<sup>2</sup>, L. Zeni<sup>1</sup>, A. Minardo<sup>1</sup>

<sup>1</sup> Department of Engineering, Università della Campania, Aversa, Italy

<sup>2</sup> Consiglio Nazionale delle Ricerche, Istituto per il Rilevamento Elettromagnetico dell'Ambiente, Napoli, Italy

### Development of a Microfluidic System for an optimized Functionalization of Plasmonic-based bio-sensor

F. Granata<sup>1,2</sup>, M. Iodice<sup>1</sup>, F. G. Delle Corte<sup>3</sup>, F. Gentile<sup>4</sup>, G. Coppola<sup>1</sup>

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<sup>2</sup> Dept. DIIES, Mediterranean University of Reggio Calabria, Reggio Calabria, Italy

<sup>3</sup> Dept. DIETI, University of Naples "Federico II", Naples, Italy

<sup>4</sup> Dept. DMSC, University "Magna Graecia" of Catanzaro, Catanzaro, Italy

## **Protein A denaturation sensing through Surface Enhanced InfraRed Absorption (SEIRA) spectroscopy**

V. Di Meo<sup>1</sup>, M. Moccia<sup>2</sup>, G. Sanità<sup>1</sup>, A. Crescitelli<sup>1</sup>, A. Lamberti<sup>3</sup>, V. Galdi<sup>2</sup>, I. Rendina<sup>1</sup>, E. Esposito<sup>1</sup>

<sup>1</sup> Institute of Applied Sciences and Intelligent Systems – Unit of Naples, National Research Council, Naples, Italy

<sup>2</sup> Fields & Waves Lab, Department of Engineering, University of Sannio, Benevento, Italy

<sup>3</sup> Department of Molecular Medicine and Medical Biotechnology, University of Naples Federico II, Naples, Italy

## **140 GHz Bandwidth Electro-Optical Modulator for FO Links based on a-Si:H/Graphene/c-Si Stacks**

E. D. Mallema<sup>1</sup>, M. Casalino<sup>2</sup>, C. Porcaro<sup>1</sup>, S. Rao<sup>1</sup>, F. G. Della Corte<sup>3</sup>

<sup>1</sup> Dept. DIIES, University Mediterranea of Reggio Calabria, Reggio Calabria, Italy

<sup>2</sup> Institute ISASI, National Research Council (CNR), Naples, Italy

<sup>3</sup> Dept. DIETI, University of Naples Federico II, 80125 Naples, Italy

## **Towards a radiation independent Lab-on-Fiber dosimeter for ultra-high dose real time monitoring**

P. Vaiano<sup>1</sup>, G. Quero<sup>1</sup>, F. Fienga<sup>2,3</sup>, V. Di Meo<sup>4</sup>, P. Casolaro<sup>5</sup>, L. Campajola<sup>6,7</sup>, G. Breglio<sup>2,3</sup>, A. Crescitelli<sup>4</sup>, E. Esposito<sup>4</sup>, A. Cutolo<sup>2</sup>, F. Ravotti<sup>3</sup>, S. Buontempo<sup>3,7</sup>, M. Consales<sup>1</sup>, A. Cusano<sup>1</sup>

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<sup>3</sup> European Organization for Nuclear Research (CERN), Genève, Switzerland

<sup>4</sup> Institute of Applied Sciences and Intelligent Systems, Unit of Naples, National Research Council, Napoli, Italy

<sup>5</sup> Albert Einstein Center for Fundamental Physics (AEC), Laboratory for High Energy Physics (LHEP), University of Bern, Switzerland

<sup>6</sup> University of Napoli Federico II, Department of Physics, Napoli, Italy

<sup>7</sup> Istituto Nazionale di Fisica Nucleare (INFN) -Sezione di Napoli, Napoli, Italy

## **Multiscale and multiphysics solvers for AlGaAs TJ-VCSEL**

A. Gullino<sup>1</sup>, A. Tibaldi<sup>1,2</sup>, F. Bertazzi<sup>1,2</sup>, M. Goano<sup>1,2</sup>, P. Debernardi<sup>2</sup>

<sup>1</sup> DET, Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129 Torino, Italy

<sup>2</sup> CNR-IEIIT, Corso Duca degli Abruzzi 24, 10129 Torino, Italy

## **Multifunctional lab-on-fiber smart cavity for biochemical sensing**

M. Giaquinto<sup>1</sup>, F. Gambino<sup>1</sup>, P. Cicatiello<sup>1</sup>, A. Micco<sup>1</sup>, A. Aliberti<sup>1</sup>, A. M. Cusano<sup>2</sup>, A. Ricciardi<sup>1</sup>, A. Cusano<sup>1</sup>

<sup>1</sup> Optoelectronics Group, Engineering Department, University of Sannio, Benevento, I-82100, Italy

<sup>2</sup> Regional Center on Information Communication Technology (CeRICT) srl, Benevento, I-82100, Italy

## **Designing power systems to charge electrical vehicle fleets in the industrial environment**

A.A. Nkemb, M. Simonazzi, D. Santoro, P. Cova, R. Menozzi, N. Delmonte

Department of Engineering and Architecture, University of Parma, Italy

## **GaN-based Isolated Resonant Converters operating in the MHz Range: a Comparative Study**

S. Cabizza and G. Spiazzi

Department of Information Engineering, University of Padova, Italy

## **Fast Learning Digital Twin with Reduced Dimensionality for Non-linear Dynamical Systems**

D. Iero<sup>1</sup>, A. Bergamin<sup>1</sup>, M. Merenda<sup>1,2</sup>, F. G. Della Corte<sup>3</sup>, R. Carotenuto<sup>1</sup>

<sup>1</sup> Department of Information, Infrastructure and Sustainable Energy Engineering, Università degli Studi "Mediterranea" of Reggio Calabria, 89060 Reggio Calabria, Italy

<sup>2</sup> Center for Digital Safety & Security, Austrian Institute of Technology GmbH Vienna, Austria

<sup>3</sup> Department of Electrical Engineering and Information Technologies

**Development and Deployment of a Deep learning techniques on ultra-low power microcontroller for AF detection from a single PPG sensor**

R. Sabbadini, M. Riccio, L. Maresca, A. Irace, G. Breglio

DIETI, Università di Napoli Federico II, Naples, Italy

**An Embeddable Object Manipulation Framework for Assistive Robotics**

G. Mezzina and D. De Venuto

Department of Electrical and Information Engineering, Politecnico di Bari, Bari, Italy

**Explaining a Deep Reinforcement Learning (DRL) Based Automated Driving Agent in Highway Simulations**

F. Bellotti, R. Berta, A. Capello, M. Cossu, A. De Gloria, S. Maestri, L. Lazzaroni

DITEN, Università degli Studi di Genova, Genova, Italy

**Telemonitoring and remote control IoT system of phytosanitary products in agricultural machinery**

L. Lucangeli<sup>1,2</sup>, E. D'Angelantonio<sup>1,2</sup>, A. Pallotti<sup>1,3,4</sup>

<sup>1</sup> Technoscience - Parco Scientifico e Tecnologico Pontino, Latina, 04100, Italy

<sup>2</sup> University of Rome "Foro Italico", Rome, 00135, Italy

<sup>3</sup> University of Rome "San Raffaele", Rome, 00166, Italy

<sup>4</sup> University of Rome "Tor Vergata", Rome, 00133, Italy

**Food Waste Prevention System to Improve Smart Homes Sustainability**

G. Mezzina, D. Ciccarese, D. De Venuto

Department of Electrical and Information Engineering, Politecnico di Bari, Bari, Italy

## Friday, September 9

### Poster Session IV (14:00-15:00)

the poster session opens at 13:00

#### **Profiling of CNNs using the MATLAB FPGA-based Deep Learning Processor**

S. Spanò, L. Canese, G.C. Cardarilli

Department of Electronic Engineering, University of Rome "Tor Vergata", Rome, Italy

#### **Lifetime estimation of power devices subjected to thermal cycling effects by considering the influence of non-constant cumulative stress**

A. Vaccaro and P. Magnone

Department of Management and Engineering, University of Padova, Italy

#### **A Stochastic Algorithm Exploiting Process Variability for the Design of True Random Number Generators Based on Digital Nonlinear Oscillators**

T. Addabbo, A. Fort, R. Moretti, M. Mugnaini, V. Vignoli

Department of Information Engineering and Mathematics, University of Siena, Siena, Italy

#### **Raman spectroscopy: a powerful tool for biomedical applications**

S. Spaziani<sup>1,2</sup>, G. Quero<sup>1,2</sup>, S. Managò<sup>3</sup>, C. Esposito<sup>1</sup>, M. Janneh<sup>1</sup>, V. Calcagno<sup>1</sup>, G. Zito<sup>4</sup>, F. Galeotti<sup>5</sup>, A. C. De Luca<sup>3</sup>, M. Pisco<sup>1,2</sup>, A. Cusano<sup>1,2</sup>

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<sup>4</sup> Institute of Applied Sciences & Intelligent Systems (ISASI), CNR, 80131, Napoli, Italy

<sup>5</sup> Istituto di Scienze e Tecnologie Chimiche "Giulio Natta" (SCITEC), CNR, 20133, Milano, Italy

#### **New Challenges on the Electromagnetic Compatibility of Electric Vehicles**

G. Cangemi, M. Fishta, E. Raviola, F. Fiori

μEMC Group, Electronics and Telecom. Dpt. (DET), Politecnico di Torino, Turin, Italy

#### **Distributed acoustic sensors for Lamb wave detection in a metallic plate**

R. Zahoor, E. Cerri, R. Vallifuoco, L. Zeni, A. Minardo

Department of Engineering, Università della Campania, Aversa, Italy

#### **Analysis and Design of a Partial-Power Post-Regulator Based DC/DC Converter for Automotive Applications**

N. Zanatta<sup>1</sup>, T. Caldognetto<sup>1</sup>, D. Biadene<sup>1</sup>, G. Spiazzi<sup>2</sup>, P. Mattavelli<sup>1</sup>

<sup>1</sup> Department of Management and Engineering, University of Padova, Vicenza, Italy

<sup>2</sup> Department of Information Engineering, University of Padova, Padova, Italy

#### **Experimental demonstration of silicon-slot quasi-bound state in the continuum in near-infrared all-dielectric metasurfaces**

J. F. Algorri<sup>1</sup>, D. C. Zografopoulos<sup>2</sup>, F. Dell'Olivo<sup>3</sup>

<sup>1</sup> Photonics Engineering Group, University of Cantabria, 39005, Santander, Spain

<sup>2</sup> Consiglio Nazionale delle Ricerche, Istituto per la Microelettronica e Microsistemi (CNR-IMM), 00133, Roma, Italy

<sup>3</sup> Department of Electrical and Information Engineering, Polytechnic University of Bari, 70125, Bari, Italy

### **IoT sensors for PFAs monitoring in water exploiting SPR-POF probes and MIPs**

F. Arcadio<sup>1,2</sup>, R. Rovida<sup>1</sup>, N. Cennamo<sup>1,2</sup>, G. D'Agostino<sup>1</sup>, C. Perri<sup>1</sup>, A. Chiodi<sup>1</sup>, G. Porto<sup>1</sup>, L. Zeni<sup>2</sup>

<sup>1</sup> Moresense Srl, Fondazione Filarete, 20139 Milano, Italy

<sup>2</sup> Department of Engineering, University of Campania Luigi Vanvitelli, 81031 Aversa, Italy

### **Low-Power Energy-Based Spike Detector for Brain-Silicon Interface**

G. Saggese and A.G.M. Strollo

DIETI - University of Napoli Federico II, Napoli, Italy

### **Plasmonic optical fiber sensors for SARS-CoV-2 rapid detection**

C. Perri<sup>1</sup>, R. Pitruzzella<sup>1</sup>, N. Cennamo<sup>1,2</sup>, G. D'Agostino<sup>1</sup>, F. Arcadio<sup>1,2</sup>, A. Chiodi<sup>1</sup>, G. Porto<sup>1</sup>, L. Pasquardini<sup>3</sup>, L. Zeni<sup>2</sup>

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<sup>2</sup> Department of Engineering, University of Campania Luigi Vanvitelli, 81031 Aversa, Italy

<sup>3</sup> Indivenire Srl, 38123 Trento, Italy

### **SPICE Modeling of Li-Ion Pouch Battery Cell Including Thermo-Electrochemical Effects**

A. P. Catalano<sup>1</sup>, C. Scognamillo<sup>1</sup>, M. Iasiello<sup>2</sup>, P. Guerriero<sup>1</sup>, L. Codecasa<sup>3</sup>, V. d'Alessandro<sup>1</sup>

<sup>1</sup> Department of Electrical Engineering and Information Technology, University Federico II, Naples, Italy

<sup>2</sup> Department of Industrial Engineering, University Federico II, Naples, Italy

<sup>3</sup> Department of Electronics, Information, and Bioengineering, Politecnico di Milano, Milan, Italy

### **A Pseudo-Softmax Function for Efficient Hardware-based Neural Networks**

G. C. Cardarilli<sup>1</sup>, L. Di Nunzio<sup>1</sup>, R. Fazzolari<sup>1</sup>, D. Giardino<sup>1</sup>, A. Nannarelli<sup>2</sup>, M. Re<sup>1</sup>, S. Spanò<sup>1</sup>

<sup>1</sup> Department of Electronic Engineering, University of Rome "Tor Vergata", Rome, Italy

<sup>2</sup> Department of Applied Mathematics and Computer Science, Danmarks Tekniske Universitet, Kongens Lyngby, Denmark

### **All-optical logic gates based on semiconductor optical amplifiers for implementing deep recurrent neural networks**

B. Alam, A. Ceschini, A. Rosato, M. Panella, R. Asquini

Dept. of Information Engineering, Electronics and Telecommunications, University of Rome "La Sapienza", Italy

### **Innovative safety monitoring system based on fiber optic sensors technology compatible with 4-20mA standard**

V. R. Marrazzo<sup>1,2</sup>, F. Fienga<sup>1,2</sup>, M. Riccio<sup>1</sup>, A. Irace<sup>1</sup>, S. Buontempo<sup>2,3</sup>, Giovanni Breglio<sup>1,2</sup>

<sup>1</sup> Università degli studi di Napoli "Federico II", Department of Electrical Engineering and Information Technology (DIETI), Napoli, Italy

<sup>2</sup> European Organization for Nuclear Research (CERN), Geneva, Switzerland

<sup>3</sup> National Institute of Nuclear Physic (INFN) Napoli Section, Napoli, Italy

### **Wearable System Based on Internet of Things for Telemonitoring and Telerehabilitation**

L. Lucangeli<sup>1,2</sup>, E. D'Angelantonio<sup>1,2</sup>, F. Caramia<sup>2,1</sup>, F. Conenna<sup>2,1</sup>, V. Camomilla<sup>2</sup>, A. Pallotti<sup>1,3,4</sup>

<sup>1</sup> Technoscience - Parco Scientifico e Tecnologico Pontino, Latina, 04100, Italy

<sup>2</sup> University of Rome "Foro Italico", Rome, 00135, Italy

<sup>3</sup> University of Rome "San Raffaele", Rome, 00166, Italy

<sup>4</sup> University of Rome "Tor Vergata", Rome, 00133, Italy

### **An Automatic Tuning System to Improve Near-Field Powering in Implanted Electronics**

R. Collu, C. Salis, M. Barbaro

Department of Electrical and Electronic Engineering, University of Cagliari, Cagliari, Italy

### **Optical fiber probe for prostatic tissue characterization**

A. Iele<sup>1</sup>, A. Ricciardi<sup>1</sup>, C. Pecorella<sup>2</sup>, A. Cirillo<sup>2</sup>, F. Ficuciello<sup>2</sup>, B. Siciliano<sup>2</sup>, R. La Rocca<sup>3</sup>, V. Mirone<sup>3</sup>, M. Consales<sup>1</sup>, A. Cusano<sup>1</sup>

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### **MILP-Based Optimization with Simulation in-the-loop for Optimal Architectural Design of 5G Networks**

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### **Recent Advances in Integrated Optical Spectrometers**

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### **A wearable electronic system based on Parylene C tattoo electrodes for EEG recording**

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### **In-Situ Thermal Impedance Extraction Technique applied to a PCB-integrated Power Device**

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### **Fiber optic hydrophones for underwater applications**

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### **Spaceborne LiDAR for Debris Detection and Tracking**

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### **Anti-Parity-Time Symmetry for High Performance Sensing in Electronics and Photonics**

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### **Ultra-low power wearable system for REM Sleep recognition**

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### **Synthetic Driving Scenarios Generator**

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### **An Embedded End to End Voice Assistant**

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### **A Fast X-ray Spectroscopic Imager for Real-time Contaminants Detection**

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### **Wireless Power Transfer Closed Loop Control for Low Power Active Implantable Medical Devices**

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### **A FPGA-Based Multi-Phase Frequency Counter with Improved Frequency Measurement Accuracy**

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### **Hierarchical binary structures as SERS-active substrates**

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### **Investigating High-Level Decision Making for Automated Driving**

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