



UNIVERSITÀ DEGLI STUDI DELL'AQUILA

Prof. Vincenzo Stornelli

Curriculum scientifico

(Aggiornato il 23/02/2019)

Position

Department of Industrial and information Engineering and Economics, University of L'Aquila.

Short Biography

Prof. Stornelli was born in Avezzano (L'Aquila). He obtained the laurea degree in Electronic Engineering (summa cum laude) at the University of L'Aquila with a thesis entitled: "Design and implementation of an electronic tuning preselector filter for applications in the UHF band". The thesis was conducted at the laboratories of R&D Dept. of Thales Italy. In April 2008 Prof. Stornelli obtained the PhD degree with a thesis on the analysis of semiconductor devices entitled: "Frequency-domain physics-based analysis of high-frequency semiconductor devices". In October 2011 Prof. Stornelli has joined as a Researcher the University of L'Aquila, Department of Electrical and Information Engineering where, since December 2014 serves as Associate Professor. Actually he teaches in the Electronic and Electronic Devices courses at the University of L'Aquila. Prof. Stornelli has several research national and international collaborations with Universities and research institutes: he had continues visiting professorship positions and cultural exchange period in international enterprises and Universities. He is author also co-inventor of 5 national patents and one international patent, 45 manuscripts on International Journals; 80 International Conference papers; 10 book chapters and 50 Italian Conference papers. Prof. Stornelli is actually member of the advisory and scientific board of the Microwave Engineering Center for Space Applications (MECSA), and is actually founder and CEO of the SENSing srl, University of L'Aquila spin-off. He is an IEEE Senior Member and serves as associate editor and as reviewer for the most important journals and international conferences in the field of electronics and is member of the editorial board of national and international scientific societies and scientific groups and has held numerous management and representation positions.

Research Activity

The scientific activity of Prof. Stornelli in the last ten years is focused in the field of analog and mixed-signal integrated circuits and architectures for information, biomedical and industrial applications, sensor interfaces and high frequency circuit and systems. The activity is documented by continuous and copious scientific publications in the following fields:

- energy harvesting systems and architectures for autonomous apparatus- The research studies in the field have been conducted on novel circuitry and architecture for high efficiency energy conversion stages and power management strategy. RF energy converter and power manager blocks have been widely investigated and developed both at discrete and integrated circuit level. Also thermoelectric and piezoelectric harvester are

under developing. In particular, different specific multi-channel RF system were developed and optimized, while an innovative strategy and system for the recovery of available RF energy was also recently developed.

- Design of analog integrated circuits for LF, RF and microwave applications- In these fields the main research activity has concerned and still concerns the design of analog integrated circuits, both in bipolar and CMOS technology, operating at low supply voltages (low-voltage, LV) and with reduced power consumption (low power, LP). The LV and LP design aspects are actually distinct but can be combined together. As far as the LV is concerned, the activity has been continuous and the consequent copious scientific production demonstrates the theoretical studies also developed during a visiting professorship research period at the Thales Italia R&D dept.

- study analysis and simulation of physics based semiconductor devices for microwave and millimeter-wave- The research activity mainly focuses on the reformulation of the equations that allow the study and prediction of the behavior of semiconductor active devices.

- "current mode" approach design- In most applications, the traditional voltage-mode technique can be replaced by the current-mode one, having the recognized advantage of overcoming the limitation of the gain-bandwidth product, typical of operational amplifiers. As integrated circuits have been implemented and fabricated with a microelectronic design in CMOS standard technology at the transistor level, several new CCII topologies, operating at low voltage and low power, with almost ideal characteristics thanks to its particular topologies.

Participation, Responsibilities, Organization and Coordination in research activities and projects:

2004 Participant in the Italian MIUR Project: ?Portable system for gas environmental monitoring with intelligent A/D integrated interface for the optimization of sensor resolution and accuracy?.

2004 Task leader for the Thales Italy group in the ARTEMOS project ?Agile RF Transceivers and Front-Ends for Future Smart Multi-Standard Communications Applications?.

2005 Participant in the Italian MIUR Project: ?High selectivity gas detection system with modulated temperature regime?.

2008 Participant in a research activity for an ASIC design ad RF for a DCR Radio receiver with the Thales Italia.

2008 Participant in the Italian MIUR Project: ?Design and fabrication of a high resolution system for the measurement of small concentrations of gases (methane and ethylene) based on the use of a new analog integrated lock-in, a microsystem black body and a carbon nanotube bolometer?.

2012 Scientific Responsible and coordinator of a research activity for the study and design of innovative wide band power amplifiers with the GEM Elettronica.

2013 Scientific Responsible and coordinator of a research activity for the study and design of innovative wide band power amplifiers with the Thales Italia s.p.a.

2014 Scientific Responsible and coordinator of a research activity on Energy harvesting architectures for outdoor ambient monitoring financed by the CARISPAQ bank.

2014 Scientific Responsible and coordinator of the MISE Project: ?Innovative Domotics System over IP?.

2015 Scientific Responsible and coordinator of the industrial Italian Project: ?Studio e ricerca di soluzioni innovative per l'integrazione in fase di produzione/installazione di sistemi domotici e ICT per la gestione

energetica intelligente dell'edificio e della sua struttura".?.

2015 Scientific Responsible and coordinator of the industrial Italian Project: ?Ricerca di algoritmi ed interface avanzate tra i sistemi che compongono le macchine industriali?.

2015 Scientific Responsible and coordinator of the industrial Italian Project: ?Sistemi di stampa digitale con elevato grado di innovazione tecnologica funzionanti su diverse tipologie di supporti?.

2015 Scientific Responsible and coordinator of the industrial Italian Project: ?Studio E Caratterizzazione Di Tecnologie Elettroniche e Materiali Per Trasmissione Dati In Modalità Ultrabroadband?.

2016 Scientific Responsible and coordinator of the POR-FESR Regional Project: ?STAMPAMI?.

2016 Participant in H2020 Project: ?CELTA : Convergence of Electronics and Photonics Technologies for Enabling Terahertz Applications?.

2017 Participant in H2020 Life Project: ?BITMAPS: Pilot technology for aerobic Biodegradation of spent TMAH Photoresist solution in Semiconductor industries?.

2017 Scientific Responsible and coordinator of the regional POR-FESR Project: ?Sviluppo di materiali composito ad elevate prestazioni e ridotto impatto ambientale a Base di matrici ecosostenibili?.

2018 Scientific Responsible and coordinator of the SME Project: ?Circuiti, sistemi e apparati per reti 5G?.

Editorial Boards and committee:

2004 -Today: Reviewer for the major journals and conferences in the electronics and Microelectronics filed as, among others, IEEE Transactions on Circuits and Systems I e II, IEEE MTT, Journal of Circuits Systems and Computers, Radioengineering, Microelectronic Journal, ISCAS, ICECS, PRIME, ICICDT, ECCDT.

2011-Today: Associate Editor of the international journal Journal of Circuits, Systems and Computers.

2015: Member of the Technical Committee and organizing committee of several International conference as, among other, ICRSTA 2015, SPLITECH 2016, ECCTD 2017, SPLITECH 2017.

2004-Today and : Organizer of several International Special Sessions and workshops.

List of Publications

Books

G.Ferri, V.Stornelli: Circuiti e Sistemi per la Microelettronica. 09/2012; l'una., ISBN: 978-88-96139-20-8

Book Chapters

Publications

Vincenzo Stornelli, Leonardo Pantoli, Giorgio Leuzzi: Microwave Active Filter Design. Microwave Systems and Applications, 01/2017; , ISBN: 978-953-51-2867-0, DOI:10.5772/65917

V. Stornelli, A. Di Carlofelice, L. Pantoli, E. Di Giampaolo: Radio frequency energy harvester for remote sensor networks. 01/2014: pages 331-334; , DOI:10.1007/978-3-319-00684-0_63

A. De Marcellis, C. Di Carlo, G. Ferri, V. Stornelli, A. Depari, A. Flammini, D. Marioli: A Novel Calibration-Less CCII-Based Resistance-to-Time Front-End for Gas Sensor Interfacing. Sensors and Microsystems, 11/2010: pages 279-284; , DOI:10.1007/978-90-481-3606-3_54

A. Depari, A. Flammini, D. Marioli, E. Sisinni, A. De Marcellis, G. Ferri, V. Stornelli: A New Fast-Readout Front-End for High Resistive Chemical Sensor Applications. Sensors and Microsystems, 01/2010: pages 273-278; , DOI:10.1007/978-90-481-3606-3_53

A. De Marcellis, C. Di Carlo, G. Ferri, V. Stornelli, A. D'Amico, C. Di Natale, E. Martinelli: A Differential Difference Current-Conveyor (DDCCII) Based Front-End for Integrable and Portable Sensor Applications. *Sensors and Microsystems*, 01/2010: pages 267-271; , DOI:10.1007/978-90-481-3606-3_52

Journal Publications

L. Pantoli, V. Stornelli, G. Leuzzi, Hongjun Li, Zhifu Hu: On-chip active filter in GaAs technology for wireless communication systems. *Analog Integrated Circuits and Signal Processing* 04/2018; , DOI:10.1007/s10470-018-1198-1

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L. Safari, S. Minaei, G. Ferri, V. Stornelli: Current-Mode Instrumentation Amplifier Based on Supply Current Sensing Technique. *AEU - International Journal of Electronics and Communications* 04/2018; , DOI:10.1016/j.aeue.2018.04.011

Leila Safari, Shahram Minaei, Giuseppe Ferri, Vincenzo Stornelli: Analysis and Design of a New COA-Based Current-Mode Instrumentation Amplifier with Robust Performance against Mismatches. *AEU - International Journal of Electronics and Communications* 03/2018; 89., DOI:10.1016/j.aeue.2018.03.021

Paolo Colucci, Arnaldo D'Amico, Andrea De Marcellis, Christian Falconi, Giuseppe Ferri, Francesco Giovannelli, Francesca Romana Parente, Vincenzo Stornelli: CCII-Based Voltage Amplifier Optimization for Reduced Relative Gain Error. *Circuits Systems and Signal Processing* 03/2018; 37(3):1315-1326., DOI:10.1007/s00034-017-0590-x

Francesca Romana Parente, Simone Di Giovanni, Giuseppe Ferri, Vincenzo Stornelli, Giorgio Pennazza, Marco Santonico: An Analog Bootstrapped Biosignal Read-Out Circuit With Common-Mode Impedance Two-Electrode Compensation. *IEEE Sensors Journal* 01/2018; PP(99):1-1., DOI:10.1109/JSEN.2018.2799849

Alessandro Depari, Emiliano Sisinni, Alessandra Flammini, Giuseppe Ferri, Vincenzo Stornelli, Gianluca Barile, Francesca Romana Parente: Autobalancing Analog Front End for Full-Range Differential Capacitive Sensing. *IEEE Transactions on Instrumentation and Measurement* 01/2018; PP(99):1-9., DOI:10.1109/TIM.2017.2785160

A. Leoni, L. Pantoli, V. Stornelli, G. Leuzzi, Zlatica Marinkovic: Automated Calibration System for RF Configurable Voltage-Controlled Filters. *Circuits and Systems II: Express Briefs, IEEE Transactions on* 01/2018; PP(99):1-1., DOI:10.1109/TCSII.2018.2790078

Alfiero Leoni, Leonardo Pantoli, Vincenzo Stornelli, Giuseppe Ferri, Petar Solic, Mladen Russo: A Combined 90/900 MHz IC Architecture for Smart Tag Application. *Journal of Communications Software and Systems* 01/2018; 14(1), DOI:10.24138/jcomss.v14i1.451

Leonardo Pantoli, Vincenzo Stornelli, Giorgio Leuzzi, Marco Bartocci, Fabrizio Trotta, Domenico Gaetano, Antonio Manna, Egidio Ciaccia, Franco Di Paolo: A GaAs 0.5-18 GHz Antenna Front-end with Integrated Limiter and Differential to Single Ended Low-Noise Amplifier. *IET Microwaves Antennas & Propagation* 12/2017; 12(6), DOI:10.1049/iet-map.2017.0094

Leonardo Pantoli, Vincenzo Stornelli, Giorgio Leuzzi: High Dynamic Range, Low Power, Tunable, Active Filter for RF and Microwave Wireless Applications. *IET Microwaves Antennas & Propagation* 11/2017; 12(4), DOI:10.1049/iet-map.2017.0685

Gianluca Barile, Giuseppe Ferri, Francesca Romana Parente, Vincenzo Stornelli, Alessandro Depari, Alessandra Flammini, Emiliano Sisinni: Linear Integrated Interface for Automatic Differential Capacitive Sensing. 08/2017; 1(4):592., DOI:10.3390/proceedings1040592

Marco Santonico, Giorgio Pennazza, Francesca Romana Parente, Simone Grasso, Alessandro Zompanti,

Vincenzo Stornelli, Giuseppe Ferri, Mariano Bizzarri, Arnaldo D'Amico: A Gas Sensor Device for Oxygen and Carbon Dioxide Detection. 08/2017; 1(4):447., DOI:10.3390/proceedings1040447

G. Ferri, F.R. Parente, V. Stornelli: Current conveyor-based differential capacitance analog interface for displacement sensing application. AEU - International Journal of Electronics and Communications 07/2017; 81., DOI:10.1016/j.aeue.2017.07.014

Tullio de Rubeis, Mirco Muttillio, Leonardo Pantoli, Iole Nardi, Ivan Leone, Vincenzo Stornelli, Dario Ambrosini: A First Approach to Universal Daylight and Occupancy Control System for Any Lamps: Simulated Case in an Academic Classroom. Energy and Buildings 07/2017; 152., DOI:10.1016/j.enbuild.2017.07.025

V. Stornelli, L. Pantoli, G. Ferri, L. Liberati, F. Centurelli, P. Monsurrò, A. Trifiletti: The AB-CCII, a novel adaptive biasing LV-LP current conveyor architecture. AEU - International Journal of Electronics and Communications 06/2017; 79., DOI:10.1016/j.aeue.2017.06.022

Leonardo Pantoli, Alfiero Leoni, Vincenzo Stornelli, Giuseppe Ferri: An IC architecture for RF Energy Harvesting systems. Journal of Communications Software and Systems 06/2017; 13(2):96., DOI:10.24138/jcomss.v13i2.377

V. Stornelli, G. Ferri, A. Leoni, L. Pantoli: The Assessment of Wind Conditions by Means of Hot Wire Sensors and a Modified Wheatstone Bridge Architecture. Sensors and Actuators A Physical 05/2017; 262., DOI:10.1016/j.sna.2017.05.005

Giuseppe Ferri, Vincenzo Stornelli, francesca romana parente, Gianluca Barile: Full range analog Wheatstone bridge-based automatic circuit for differential capacitance sensor evaluation. International Journal of Circuit Theory and Applications 10/2016;, DOI:10.1002/cta.2298

P. Di Marco, V. Stornelli, G. Ferri, L. Pantoli, A. Leoni: Dual band harvester architecture for autonomous remote sensors. Sensors and Actuators A Physical 07/2016; 247., DOI:10.1016/j.sna.2016.06.040

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P. Branchi, L. Pantoli, V. Stornelli, G. Leuzzi: RF and microwave high-Q floating active inductor design and implementation. International Journal of Circuit Theory and Applications 04/2014; 43(8), DOI:10.1002/cta.1991

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V. Stornelli, L. Pantoli, G. Leuzzi: High Quality Factor L-Band Active Inductor-Based Band-Pass Filters. *Journal of Circuits, Systems and Computers* 03/2013; 22(03)., DOI:10.1142/S021812661350014X

Giorgio Leuzzi, Vincenzo Stornelli: SB μ PE drift-diffusion algorithm for FET devices global modeling. *Microelectronics Journal* 01/2013; 44(1)., DOI:10.1016/j.mejo.2011.07.013

Paolo Colucci, Giorgio Leuzzi, Leonardo Pantoli, Vincenzo Stornelli: Third order integrable UHF bandpass filter using active inductors. *Microwave and Optical Technology Letters* 06/2012; 54(6)., DOI:10.1002/mop.26857

Giuseppe Ferri, Vincenzo Stornelli, Alessia di Simone: A CCII-Based High Impedance Input Stage for Biomedical Applications.. *Journal of Circuits, Systems and Computers* 12/2011; 20(08):1441-1447., DOI:10.1142/S021812661100802X

Giorgio Leuzzi, Vincenzo Stornelli, Stefano Del Re: A Tuneable Active Inductor With High Dynamic Range for Band-Pass Filter Applications. *Circuits and Systems II: Express Briefs, IEEE Transactions on* 10/2011; 58-II(10):647-651., DOI:10.1109/TCSII.2011.2164145

Andrea De Marcellis, Claudia Di Carlo, Giuseppe Ferri, Vincenzo Stornelli: A CCII μ based wide frequency range square waveform generator. *International Journal of Circuit Theory and Applications* 01/2011; 41(1)., DOI:10.1002/cta.781

A. Depari, A. Flammini, D. Marioli, E. Sisinni, A. De Marcellis, G. Ferri, V. Stornelli: A New and Fast-Readout Interface for Resistive Chemical Sensors. *IEEE Transactions on Instrumentation and Measurement* 06/2010; 59(5-59):1276 - 1283.

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A. D'Amico, A. De Marcellis, C. Di Carlo, C. Di Natale, G. Ferri, E. Martinelli, R. Paolesse, V. Stornelli: Low-voltage low-power integrated analog lock-in amplifier for gas sensor applications. *Sensors and Actuators B Chemical* 02/2010; 144(2-144):400-406., DOI:10.1016/j.snb.2009.01.045

Paolo Colucci, Giorgio Leuzzi, Vincenzo Stornelli: HF Class-E based multiplier circuits. DOI:10.1109/INMMIC.2010.5480108

Giuseppe Ferri, Andrea De Marcellis, Claudia Di Carlo, Vincenzo Stornelli, Alessandra Flammini, Alessandro Depari, Daniele Marioli, Emiliano Sisinni: A CCII-Based Low-Voltage Low-Power Read-Out Circuit for DC-Excited Resistive Gas Sensors. *IEEE Sensors Journal* 01/2010; 9(12-9):2035 - 2041., DOI:10.1109/JSEN.2009.2033197

Giuseppe Ferri, Claudia Di Carlo, Vincenzo Stornelli, Andrea De Marcellis, Alessandra Flammini, Alessandro Depari, Nader Jand: A single-chip integrated interfacing circuit for wide-range resistive gas sensor arrays. *Sensors and Actuators B Chemical* 12/2009; 143(1-143):218-225., DOI:10.1016/j.snb.2009.09.002

A. De Marcellis, G. Ferri, N. C. Guerrini, G. Scotti, V. Stornelli, A. Trifiletti: The VCG-CCII: A novel building block and its application to capacitance multiplication. *Analog Integrated Circuits and Signal Processing* 08/2009; 58(1):55-59., DOI:10.1007/s10470-008-9213-6

V. Stornelli, G. Leuzzi: Global modeling of multifinger MOSFETs with SB-SP combined analysis. DOI:10.1109/RME.2009.5201343

Vincenzo Stornelli, Giuseppe Ferri, King Pace: CMOS pulse generator for BPSK, OOK, PAM, and PPM modulations. *Journal of Circuits, Systems and Computers* 05/2009; 18(3):487-495., DOI:10.1142/S0218126609005320

Vincenzo Stornelli: Low voltage Low Power Fully Differential Buffer.. *Journal of Circuits, Systems and Computers* 05/2009; 18(3):497-502., DOI:10.1142/S0218126609005319

Andrea De Marcellis, Giuseppe Ferri, Nicola Carlo Guerrini, Giuseppe Scotti, Vincenzo Stornelli, Alessandro Trifiletti: A novel low-voltage low-power fully differential voltage and current gained CCII for floating impedance simulations. *Microelectronics Journal* 01/2009; 40(1-40):20-25., DOI:10.1016/j.mejo.2008.08.014

Giorgio Leuzzi, Vincenzo Stornelli: Physical/electromagnetic analysis of multifinger MOSFETs with SB-SP combined methods. *International Journal of RF and Microwave Computer-Aided Engineering* 01/2009; 20(2):141 - 147., DOI:10.1002/mmce.20408

Giorgio Leuzzi, Vincenzo Stornelli: A Frequency- and Space-Domain Series-Expansion Approach for Efficient Numerical Modeling of Semiconductor Devices. *IEEE Transactions on Electron Devices* 01/2009; 55(12-55):3525 - 3531., DOI:10.1109/TED.2008.2006740

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Andrea De Marcellis, Alessandro Depari, Giuseppe Ferri, Alessandra Flammini, Daniele Marioli, Vincenzo Stornelli, Andrea Taroni: Uncalibrated integrable wide-range single-supply portable interface for resistance and parasitic capacitance determination. *Sensors and Actuators B Chemical* 06/2008; 132(2-132):477-484., DOI:10.1016/j.snb.2007.10.068

Christian Falconi, Giuseppe Ferri, Vincenzo Stornelli, Andrea De Marcellis, Daniele Mazziere, Arnaldo D'Amico: Current-Mode High-Accuracy High-Precision CMOS Amplifiers. *Circuits and Systems II: Express Briefs, IEEE Transactions on* 06/2008; 55(5-55):394 - 398., DOI:10.1109/TCSII.2007.914407

Giuseppe Ferri, Vincenzo Stornelli, Andrea De Marcellis, Alessandra Flammini, Alessandro Depari: Novel CMOS fully integrable interface for wide-range resistive sensor arrays with parasitic capacitance estimation. *Sensors and Actuators B Chemical* 03/2008; 130(1-130):207-215., DOI:10.1016/j.snb.2007.08.001

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