Danilo Demarchi

Curriculum Vitae

Personal Information

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Date of birth December 6, 1964

Education and Training

1996 **PostDoc Fellow**, *Circuits and Microsystems for DNA analysis*, Politecnico di Torino, Department of Electronics

1993-1995 **PhD in Electronics Engineering**, *Politecnico di Torino*, Thesis: "Microelectronic applications for analysis and diagnosis of genetic diseases", Partially developed at the Children's Hospital of Philadelphia, USA

1991 **Master Degree in Electronics Engineering**, *Politecnico di Torino*, Thesis: "Proxima, a VLSI PROLOG Processor"

Academic Position @Politecnico di Torino

Position held **Full Professor**, *Department of Electronics and Telecommunications*

Tenures **BioNanoelectronics and Biomolecular Computing**, PhD School in Electronics Engineering

Introduction to MEMS and BioMEMS, Master Degrees in Electronics and Biomedical Engineering

Design of Microsystems, Master Degrees in Electronics Engineering and Micro and Nanotechnologies for ICT

Electronics, Bachelor Degree in Biomedical Engineering

International Affiliations

2018-2021 **Visiting Professor**, Tel Aviv University, School of Electrical Engineering, Israel

Jun19-Sept19 **Visiting Professor**, École Politechnique Fédérale de Lausanne (EPFL), Integrated Circuits Laboratory, Switzerland

August 2018 **Visiting Scientist**, MIT and Harvard Medical School, Motion Analysis Lab, Spaulding Rehabilitation Hospital, Boston, MA, USA, MITOR Project SISTER, Smart electronic Iot SysTEms for Rehabilitation sciences

2016 **International Faculty Affiliate**, *University of Chicago (UIC)*, Department of Electrical and Computer Engineering, USA

Leadership & Tutoring

Head of the Micro&Nano Electronic Systems (MiNES) Group, Design and impelmentation of micro&nano electronic systems and sensors (http://mines.polito.it)
2 Full Professors, 3 Post-Docs, 2 Assistant Researchers, 1 Technician, 8 PhD Students

International Student Exchange Advisor for Electronics Engineering, Academic management of curricula of outgoing students, management and recruitment of contacts with international universities

Tutoring of Students and PostDocs, in about 30 years tutor of 267 Master Thesis Students, 26 PhD Students, 9 PostDocs

Leader of the Italian Institute of Technology IIT@DET Group, Study and implementation of smart systems for robotics and bio-inspired electronics

Experience

Honors

2022 **TPC Co-Chair**, IEEE BioCAS 2022, October 2022, Taipei, Taiwan

2021 **TPC Co-Chair**, IEEE BioCAS 2021, October 2021, Berlin, Germany

2020-today **CAS Society Representative in the IEEE Sensors Council**

2020-today **Member of the PhD Council**, *Politecnico di Torino*, PhD in Electronic, Electrical and Telecommunication Engineering

2020-today **Member of the SINANO Governing Board**, *the European Academic and Scientific Association for Nanoelectronics*

2020-today **Member of the Focus Group**, *METIS (MicroElectronics Training, Industry and Skills)*, Erasmus+

2019-today **Member of the board "Italia 2030" of Italian Ministry of Economic Development**, *Technical Board on Circular Economy: Leadership Green*, AgriFood section

2021 **Corresponding Guest Editor**, IEEE Journal on Emerging and Selected Topics in Circuits and Systems, JETCAS, Special Issue on Circuits and Systems for Smart Agriculture and Healthy Foods

2020 **General Co-Chair**, IEEE FoodCAS 2020 @ISCAS20, Oct 2020
https://www.iscas2020.org/iscas2020/foodcas

2019 **Nominated General Co-Chair**, IEEE FoodCAS 2019 @ISCAS19, May 2019, Sapporo, Japan
http://www.knt.co.jp/ec/2019/foodcas

2019-today **Associate Editor**, Open Journal of Engineering in Medicine and Biology (OJ-EMB), IEEE

2019 **TPC co-chair of the IEEE 2019 ICECS Conference**, *December 2019, Genova, Italy*
https://www.ieee-icecs2019.org/home-page-en

2017 **General Chair**, IEEE BioCAS 2017, October 2017, Torino, Italy
http://biocas2017.org

2017 **Founder and Co-chair of FoodCAS**, *the first international workshop on Circuits and Systems for food industry*

2017–today **Team Leader of IRDS (International Roadmap on Devices and Systems) roadmap about the Medical Devices Market Driver**, https://irds.ieee.org/images/files/pdf/2017/2017IRDS_MD_MDEVs.pdf

2013–today **Member of Biomedical Circuits and Systems Technical Committee**, IEEE BioCAS

2015-today **Associate Editor**, Sensors Journal, IEEE

2013–today **Associate Editor**, BioNanoScience, Springer

2016-2019 **Associate Editor**, Transactions on Biomedical Circuits and Systems, IEEE

2017–today **Contributor to the "Electronic Components and Systems Research Agenda (ECS-RA)"**, Chapter 6 – Systems and Components: Architecture, Design and Integration

2016-today **Member of AENEAS (Association for European NanoElectronics ActivitieS) Scientific Council**, the Scientific European Council to establish, strengthen and optimise interactions and cooperation between Europe's scientific community and industry in micro-nano electronics

2010–2012 **Advisory Committee Member**, FP7 Coordination Action project "Ecosystems Technology and Design for NanoElectronics", (NANO-TEC)

2008-today **Senior Member**, the Institute of Electrical and Electronic Engineers (IEEE)

Awards

2020 **IEEE Sensors Council Best Paper Award**, *IEEE Medical Measurements & Applications, MeMeA 2020*, for the paper "S. Aiassa, J.D. González Martınez. D. Demarchi, S. Carrara, *New Measurement Method in Drug Sensing by Direct Total-Charge Detection in Voltammetry"*

2018 **Top 10% of papers published in Lab on a Chip**, for the paper "L. Morelli, D. Demarchi, A. Boisen et al. *Injection molded lab-on-a-disc platform for screening of genetically modified e. coli using liquid-liquid extraction and surface enhanced raman scattering*, Lab Chip, 81:4458–4466, 2018", Feb. 2018

2017 **Gold Leaf Award**, IEEE NGCAS 2017, for the paper "F. Stradolini, A. Tuhoeti, P. Motto Ros, D. Demarchi, and S. Carrara, *Raspberry Pi Based System for Portable and Simultaneous Monitoring of Anesthetics and Therapeutic Compounds*", Sep. 2017

2017 **Outstanding Performance**, IEEE EDUCON 2017, for the paper "M. Ruo Roch, D. Demarchi, and S. Tzanova, *Work-in-Progress: MicroElectronics Cloud Alliance*", Apr. 2017

2016 **Best Paper Award**, MOBIHEALTH 2017, for the paper "F. Stradolini, E. Lavalle, G. De Micheli, P. Motto Ros, D. Demarchi, and S. Carrara, *Paradigm-Shifting Players for IoT: Smart-Watches for Intensive Care Monitoring*", Nov. 2016

Recent Invited Talks

2020 **Let the Plants do the Talking**, *Remote Talk*, IEEE CAS Seasonal School: How Technology is Impacting Agribusiness, Chile

2020 **Precision Agriculture for Plant Health**, *Remote Talk*, From Plant Health to Community Health Workshop, Brescia, Italy

2020 **Bio-Inspired Electronic Systems for Biomedical Applications and Robotics**, *Remote Talk*, Bar Ilan University, Israel

2020 **Bio-Inspired Electronic Systems for Biomedical Applications and Robotics**, *Remote Talk*, Bionic Institute, Melbourne, Australia

2019 **Tutorial: Bio-Inspired Electronic Systems for Biomedical Applications and Robotics**, *https://www.prime2019.com/tutorials*, PRIME, 15^{th} Conference on PhD Research in Microelectronics and Electronics, Lausanne, Switzerland

2018 **Bio-Inspired Electronic Systems for Biomedical Applications and Robotics**, Seminar at Google Inc. Mountain View, CA, USA

2018 **Quality-Energy Trade-off and Bio-Inspired Electronic Systems**, ICSEE 2018 Symposia, Eilat, Israel

2018 **Bio-Inspired Electronic Systems for Ultra Low Power Implantable Devices**, Houston Methodist Hospital, Houston, TX, USA

2018 **Micro-for-Nano: a synergy between nanomaterials and CMOS electronics for (bio)sensing applications**, Tel Aviv University, Tel Aviv Israel

Research Support

PI in past 10 years of 24 funded projects, with a **total raised funding of more than 3.5 M€**. Applicant of the Erasmus European Project NanoEI, partner in FP6, FP7, H2020, ECSEL, Tempus, Erasmus and Erasmus+ calls

2020 **Vinci 2020 Evaluator**, Call for Proposals 2020, The French-Italian University (UFI)

2019 **Fonds de la Recherche Scientifique (FNRS) Evaluator**, Call for Proposals 2019, Equipment Credit, Sciences Exactes et Naturelles

2018 **Israeli Ministry of Science Project Evaluator**, Call for Proposals 2018 in the areas: Robotics, Medical Devices and Big Data

2017-2018 **Member of International PhD Boards**, evaluation of PhD Defences at University of South-Eastern Norway, University of Udine, Politecnico di Milano, EPFL Lausanne, Tel Aviv University, University of Oslo

2015 **Horizon2020 Project Evaluator**, Electronic Components and Systems for European Leadership (ECSEL) 2015 calls

2015 **Project Evaluator**, ASTER Research Projects, Emilia Romagna Region

2013 **National Project Evaluator**, French "Agence Nationale de la Recherche (ANR)"

Rankings and Top 5 Publications

Author and co-author of more than 300 scientific publications in books, journals and peer-reviewed conference proceedings and of 5 patents.

H-Indexes Since 2011	
Scopus	22
Google Scholar	26

The five most significant publications are:

- G. Bruno, D. Demarchi, M. Ferrari, A. Grattoni et al. Unexpected behaviors in molecular transport through size-controlled nanochannels down to the ultra-nanoscale. **Nature Communications**, 9(1):508, 2018.
- S.R. Shin, D. Demarchi, M.R. Dokmeci, A. Khademhosseini et al. Electrically driven microengineered bioinspired soft robots. **Advanced Materials, IF=19.79**, page 1704189, 2018.
- B. Miccoli, V. Cauda, A. Bonanno, A. Sanginario, K. Bejtka, F. Bella, M. Fontana, D. Demarchi. One-Dimensional ZnO/Gold Junction for Simultaneous and Versatile Multisensing Measurements. Scientific Reports, 6:srep29763, 2016.
- S. Sapienza, C. Crepaldi, P. Motto Ros, A. Bonanno, D. Demarchi. On Integration and Validation of a Very Low Complexity ATC UWB System for Muscle Force Transmission. IEEE Transactions on Biomedical Circuits and Systems, 10:497-506, 2016.
- M. Crepaldi, D. Daprà, A. Bonanno, I. Aulika, D. Demarchi, P. Civera. A Very Low- Complexity 0.3-4.4 GHz 0.004 mm^2 All-Digital Ultra-Wide-Band Pulsed Transmitter for Energy Detection Receivers. IEEE Transactions on Circuits and Systems-I (TCAS-I), 59(10):2443-2455, 2012.

Highlights

AgriFood Electronics	**Innovation activities for Electronics applied to AgriFood**. Setup of a research group inside Politecnico di Torino for developing electronic applications for AgriFood. Founder in 2017 inside IEEE of the workshop FoodCAS (Circuits and Systems for Better Quality Food) and of the Special Interest Group of CAS Society about AgriFood Electronics, starting specific activities about the use of electronics for the AgriFood chain of value.
BioMEMS	**Pioneer of the research on Biomedical Electronic Systems in Italy**. Starting from a PhD visiting period in 1994 at the Children's Hospital of Philadelphia, setup in Torino of one of the first groups working in Italy on MEMS for Biomedical applications.
Cooperation	**Active cooperations with the most important international research centers**, sharing research projects, high level publications and academic activities.
Funding/Group Management	**Long experience in leadership of research groups and excellent fund raising**, as PI of 24 research projects with more than 3.5 M€ budget in last ten years.
Teaching	**Strong international teaching experience** at all grade levels: Bachelor, Master and PhD.

CV Details

Projects and Fund Management - List of Projects and Funding

2021-today **AI4CSM**, *Automotive Intelligence for Connected Shared Mobility*, Budget 100 k€
H2020 ECSEL

2020-today **FruitGuard**, *Sistema per la gestione, tutela e valorizzazione della filiera frutticola*, Budget 174 k€
POSR/FESR Azione 2, Operazione 16.1.1, **Coordinator**

2020-today **WappFruit**, *Tecnologie intelligenti applicate alla gestione dell'acqua in frutticoltura*, Budget 146 k€
POSR/FESR Azione 2, Operazione 16.1.1, **Coordinator**

2020-today **Lanzi Srl**, *Sistemi automatizzati per la sicurezza sul lavoro con dispositivi di protezione individuale intelligenti (SPAS4S Project)*, Budget 136 k€

2020-today **MECT Srl**, *Sistemi automatizzati per la sicurezza sul lavoro con dispositivi di protezione individuale intelligenti (SPAS4S Project)*, Budget 30 k€

2020 **LMA Srl**, *Gestione dei Dati Evoluta (GDE) Project*, Budget 60 k€

2020 **Omnidermal Srl**, *Automatic Breathing Unit (ABU) V2 Project*, Budget 24 k€

2016–today **NanoEl-Asia**, *Internationalised Master Degree Education in Nanoelectronics in Asian Universities*, Budget 85,17 k€
Erasmus+ Capacity Building in Higher Education, Proposal Number 573828-EPP-1-2016-1-BG-EPPKA2-CBHE-JP. Partner, WorkPackage leader.

2020 **Omindermal Srl**, *Electronic Systems for Offshore Drilling*, Budget 69 k€

2018 **ENI Spa**, *Electronic Systems for Offshore Drilling*, Budget 69 k€

2018 **SISTER**, *Smart electronic Iot SysTEms for Rehabilitation sciences*, Wearable systems to study muscle synergies in patients undergoing rehabilitation after neurological accidents, Budget 20 k$
MITOR, M.I.T. – Politecnico di Torino Project.

2017 **FIAT Chrysler Automobiles Spa**, *Electronic Systems for CO_2 reduction*, Budget 17 k€

2015–2018 **NEREID**, *NanoElectronics Roadmap for Europe: Identification and Dissemination*, Budget 66.5 k€
H2020 CSA ICT-25-2015. Partner, WorkPackage leader.

2015 **GEPEV**, *Studio di Fattibilità di un Dispositivo per la Genesi di Potenziali Evocati Visivi (VEP) Intraoperatori - Feasibility study of a device for the generation of Intersurgical Visual Evoked Potentials (VEP)*, Budget 8.4 k€
Piedmont Region, Innovation and SMEs

2015–2020 **DOCMEN**, *Development of two cycle innovative curricula in microelectronic engineering*, Budget 48 k€
Erasmus+ Capacity Building in Higher Education, Proposal number 561627-EPP-1-2015-1-PL-EPPKA2-CBHE-JP. Partner, WorkPackage leader.

2015–2018 **MECA**, *MicroElectronics Cloud Alliance*, Budget 116 k€
Erasmus+ Knowledge Alliances, Proposal number 562206-EPP-1-2015-1-BG-EPPKA2-KA. Partner, WorkPackage leader.

2014–2018 **Lab4MEMS-II**, *LAB FAB for smart sensors and actuators MEMS*, Budget 300 k€
Project number ENIAC 621176, Partner.

2014–2015 **Smart2Wear**, *Wearable System for BioImpedance Measurements for Cardiac Diseases*, Budget 70 k€
Regional Project of Piedmont Region, WorkPackage Leader.

2013–2017 **EduNano**, *Education in Nanotechnologies*, Budget 74 k€
Grant agreement number 543861-TEMPUS-1-2013-BG-TEMPUS-JPCR. Partner, WorkPackage leader.

2013 **Eltek Spa**, *Study of innovative sensors for Automotive and Biomedical Applications*, Budget 21 k€

2012–2017 **Lab4MEMS**, *LAB FAB for smart sensors and actuators MEMS*, Budget 250 k€
Project number ENIAC 325622-2, Partner.

2012–2015 **SMAC**, *SMArt systems Co-design*, a flexible software platform for smart subsystems/components design and integration, Budget 351 k€
Grant agreement number 288827, EU FP7, WorkPackage Leader.

2011–2014 **NanoEI**, *Master Degree Modules in Nanotechnologies for Electronics*, Budget 109 k€
510196-LLP- 1-2010-1-IT-ERASMUS-ECDCE, EU FP7, Applicant.

2011–2014 **NanoSkills**, *Training new skills for the new jobs in nanotechnologies*, Budget 106 k€
510591-LLP-1- 2010-1-FR-LEONARDO-LMP, EU FP7, WorkPackage Leader.

2010–2012 **Stimesi-2**, *Stimulation action on MEMS and SiP design*, Budget 68 k€
Grant agreement number 257862, EU FP7, WorkPackage Leader.

2009–2012 **R&D Access**, *Identification of R&D results on semiconductor design from FP7 projects and provision of these results to partners from outside the consortia*, Budget 202 k€
ICT-2009.3.2, EU FP7. Partner, WorkPackage Leader.

2008–2012 **NanoContact**, *Carbon Nanotube based Conductive Composites Laser Activated for Integrated Sensors, Switches and Wirings*, Budget 432 k€
Regional Project of Piedmont Region, WorkPackage Leader.

2008–2010 **EuroTraining**, *Provision of a European Training Infrastructure for micro and nano technologies*, Budget 314 k€
ICT-2007-1, EU FP7, WorkPackage Leader.

2008–2010 **Eurotraining-MST**, *Establishment of microsystems training requirements in Europe*, Budget 240 k€
ICT-2007.3.6, EU FP7, WorkPackage Leader.

2006–2009 **ToxiChip**, *Development of a toxin screening multi-parameter on-line biochip*, Budget 249 k€
Specific Targeted Research, 027900, EU FP6, WorkPackage Leader.

2006-2009 **microBUILDER**, *An integrated modular service for microfluidics*, Budget 169 k€
IST-2004-2.4.2, EU FP6, Partner.

Most Important Cooperations

Industry

ST Microelectronics, Biomedical Smart Systems [52, 191, 204]. Design of MEMS for sensing. Study of integrated CAD tools for the design of mixed systems [90, 199, 237, 250, 251, 271]. Development of applications for the iNemo platform. Study of molecule based structures for Nanoelectronics and QCA architectures [286]
Projects: Lab4MEMS, SMAC, Lab4MEMS-II.

ENI Spa, Study and design of electronic systems for Offshore Drilling
Projects: 2 Industrial Funded Projects.

Centro Ricerche FIAT-FCA, Magneti Marelli Spa, RTM Spa and MECT Srl, Study of polymeric substrates, funtionalized with Carbon NanoTubes, for the realization of innovative electronic systems, in particular applied to Automotive, patented application [104, 131]
Projects: NanoContact, CO_2 reduction.

Eltek Group, two Industrial Contracts for (i) study of innovative sensors based on Nanogap structures for Automotive; (ii) ElectroChemiluminescent sensors for Biomedical Applications [101]

Research and Academia

École Politechnique Fédérale de Lausanne, *Integrated Circuits Laboratory Neuchâtel and Campus Biotech Geneva*, Prof. Sandro Carrara, Prof. Diego Ghezzi and Prof. Silvestro Micera, Lausanne, Switzerland
Single Molecule Sensing, Sensors for HealthCare and Diagnostics, IoT devices for biomedicine, ImpIntable Systems for Neurostimulation [3, 14, 15, 20, 49, 46, 63, 114, 179, 192, 193, 200, 202, 203, 55, 213, 222, 226, 240, 242, 246, 255, 278]. Co-Tutoring of 15 Master and 5 PhD Thesis.

Harvard-MIT Partners HealthCare, Spaulding Rehabilitation Hospital, *Motion Analysis Laboratory*, Boston, MA, USA, Prof. Paolo Bonato
Study of biosignals and read-out electronics [16, 19, 31, 60, 55, 194, 195, 206]. Co-Tutoring of 12 Master Thesis, 2 PhD Thesis and 1 PostDoc.
Projects: SISTER.

Tel Aviv University, *Center for Nanoscience and Nanotechnology*, Israel, Prof. Yosi Shacham, Prof. Yael Hanein and Prof. Amir Boag
Study and implementation of Single Molecule Sensors. Nanoelectronic Devices and related Advanced E-Learning Solutions [5, 54, 171, 205, 252, 261, 262, 265, 273, 274]. MicroDevices for the characterization of Cell Cultures.
Projects: NanoEl-Asia, EduNano, NanoEl, NanoSkills, Toxichip.

Methodist Hospital Research Institute, *Department of Nanomedicine*, Houston, TX, USA, Prof. Alessandro Grattoni and Prof. Carly Filgueira
Study of drug delivery nanochannels for implantable technologies [**?** 30, 47, 43, 45, 53, 56, 66, 223]. Co-Tutoring of 16 Master and 4 PhD Thesis.

University of California at Los Angeles, UCLA, *Khademhosseini Lab*, Prof. Ali Khademhosseini, Dr. Mehmet Dokmeci
Organs on Chips [42, 61, 63, 67, 89, 100, 109, 117]. Co-Tutoring of 35 Master Thesis and 1 PhD Thesis.

Tyndall National Institute, Cork, Ireland

Study of Wireless Interfaces for Sensor Networks [250], MicroDevices for the characterization of Cell Cultures [303, 309], MicroNeedles for Micro Transdermal Interface [50, 218]. Co-Tutoring of 22 Master Thesis.
Projects: SMAC, Toxichip, NEREID.

University of South-Eastern Norway, *Norwegian Center of Expertise on Microsystems*, Tonsberg, Norway, Prof. Per Ohlckers, Prof. Kristin Imenes, Prof. Knut Aasmundtveit and Prof. Tao Dong

Microsystem design for Biomedical Applications and Microfluidics [107, 268]. Advanced Teaching of MicroTechnologies [319]. Co-Tutoring of 5 Master Thesis.
Projects: MicroBUILDER, Stimesi-2, NanoEl-Asia.

STFC, Rutherford Appleton Laboratory, *Particle Physics Department*, Didcot, Oxfordshire, UK, Dr. Giulio Villani

In cooperation with the University of Bologna and the Istituto Nazionale di Fisica Nucleare (Dr. Alessandro Gabrielli), development of integrated devices for radiation sensing [57, 68, 75, 65, 96, 86, 85, 99, 125, 124, 264, 267, 299, 302, 305, 306, 307, 312, 316, 318].

USF University of South Florida, *Electrical Engineering Department*, Tampa, FL, USA, Prof. Stephen Saddow

Application of Silicon Carbide (SiC) to BioSensors, in particular to electrodes for Electro-ChemiLuminescence [266]. Co-Tutoring of 2 Master Thesis.

Fondazione Cardiocentro Ticino, Lugano, Switzerland, Dr. Lucio Barile

Research activities on the analysis and stimulus of Cardio Cells. Co-Tutoring of 1 Master Thesis.

FSRM, Fondation Suisse pour la Recherche en Microtechnique, Neuchatel, Switzerland, Dr. Philippe Fischer, Dr. Annette Loecher

International teaching on Microsystem Technologies and Sensing Devices.
Projects: Eurotraining, Eurotraining-MST.

UC Berkeley, *Berkeley Sensor & Actuator Center (BSAC)) Group*, Berkeley, CA, USA, Prof. Michel Maharbiz

Transmission and study of biosignals, read-out electronics. Co-Tutoring of 6 Master Thesis.

HEIG-VD, University of Applied Sciences of Western Switzerland, *Institute of Micro&Nano Technologies*, Yverdon, Switzerland, Prof. Silvia Schintke

Study of Carbon Nanotubes as electrodes for Sensing, course held on this topic at Yverdon on June 2012. Advanced E-Learning Solutions for Nanoelectronics [262, 252, 265, 273, 274].
Projects: NanoEL, NanoSkills.

HES-SO, Haute École Spécialisée de Suisse Occidentale, *Génie électrique et Technologie Industrielle*, Fribourg, Switzerland, Prof. Marco Mazza.

Research on Microsystems for Sensing and Applied Electronics for Signal Conditioning [207]. Co-Tutoring 5 Master and 1 PhD Thesis

Technical University of Munich, *Institute for Nanoelectronics*, Munich, Germany, Prof. Paolo Lugli

Study of Nanoelectronic devices for novel architectures, in particular for QCA systems. Study of nanodevices for the realization of advanced sensors, course held on this topic at Munich on December 2011. Co-Tutoring of 2 PhD and 4 Master Thesis.

DTU, Danish Technical University, Lyngby, Denmark, Prof. Erik Bruun and Prof. Anja Boisen

Web-based tools for Nanoelectronics teaching (Prof. Bruun) [290] and study of Microtechnologies for BioSensing (Prof. Boisen) [29, 40, 48]. Co-Tutoring of 8 Master Thesis.
Projects: Eurotraining, Eurotraining-MST.

JRC, Joint Research Center, *Nanobiotechnology Group*, Ispra, Italy, Dr. François Rossi and Dr. Pascal Colpo

Research on Single Molecule Sensors, in particular for the study of proteins for diagnostic devices [165]. Study of MicroDevices for the characterization of Cell Cultures [240, 242].
Projects: Toxichip.

Grenoble INP, *CIME-Nanotech*, Grenoble, France, Dr. Philippe Morey-Chaisemartin

Development of E-Learning tools for Nanoelectronics [252, 261, 262, 265, 273, 274].
Projects: NanoEL, NanoSkills.

IMEC, *Europractice Group*, Leuven, Belgium, Prof. Carl Das and Dr. Jan Bienstman

Development and teaching in Europe of courses for the dissemination of Microsystem Technologies.
Projects: Stimesi-2.

Technical University of Sofia, *Department of Electronics*, Sofia, Bulgaria, Prof. Slavka Tzanova

Development of E-Learning tools for Nanoelectronics [252, 261, 262, 265, 273, 274].
Projects: NanoEl-II, DOCMEN, MECA, EduNano, NanoEL, NanoSkills.

University of Sidney, *Laboratory for Multiscale Systems*, Sidney, Australia, Dr. Ali Abbas

Study of Microdevices for the Analysis of Cell Cultures. Co-Tutoring of 3 Master Thesis.

BME University, *Department of Electronics*, Budapest, Hungary, Prof. Zsolt Illyefalvi-Vitez and Prof. Oliver Krammer

Development of teaching modules for Microsystems (microBUILDER) and for Nanoelectronics (Eurotraining) [290].
Projects: microBUILDER, Eurotraining, Eurotraining-MST, MECA.

IMT, Institute for MicroTechnologies, Bucharest, Romania, Dr. Carmen Moldovan

Study of Microdevices and Sensors for Cell Cultures [303, 309].
Project: Toxichip.

Teaching

Course Tenure History at Politecnico di Torino

2018-today **BioNanoelectronics and Biomolecular Computing**, *PhD School in Electronics Engineering*

2016-today **Electronics**, *Bachelor Degree in Biomedical Engineering*

2014-today **CAD for MicroSystems**, *Master Degrees in Electronics Engineering and Nanotechnologies for ICT*

2011-today **Bio-Micro&Nano Systems**, *Master Degrees in Electronics and Biomedical Engineering*

2011-2018 **Micro&Nano Systems**, *Master Degrees in Electronics Engineering and Nanotechnologies for ICT*

2010-2017 **Nanoelectronics**, *PhD School in Electronics Engineering*

2006-2011 **Electronics**, *Bachelor Degree in Biomedical Engineering*

2004-2008 **Systèmes électroniques numèriques**, *Master Degree in Information Technology*, Turin (Italy) - Grenoble (France)

2001-2006 **Electronic Systems**, *Master Degree in Electronics Engineering*

2001-2005 **Electronics for Telecommunications**, *Master Degree in Electronics Engineering*

Tutoring of Master Thesis and PhD Students

Master Thesis **Academic Tutor of 267 Master Thesis**, *in Electronics Engineering, Biomedical Engineering and Nanotechnologies for ICT*

PhD Students **Tutor of 26 PhD Students**, *in Electronics Engineering and Biomedical Engineering*

International teaching and seminars

2016–today **Module of NanoBioSensors**, *Micro&Nano Electronics, Tel Aviv University*, http://edunano-lms.tau.ac.il/mod/page/view.php?id=1398
Tel Aviv, Israel.

2018 **Building tomorrow society: NanoElectronics & Photonics**, *Nanoelectronics Module*
Politecnico di Torino Summer School.

2018 **Bio-Inspired Micro&Nano Electronic Systems for Robotics and Biomedical Applications**, *DOCMEN Master Class*
Synopsys Armenia Educational Department, Yerevan, Armenia.

2018 **From Atoms to Systems**, *DOCMEN Master Class*
Yerevan State University, Yerevan, Armenia.

2017 **Bio-Inspired Micro&Nano Electronic Systems for Robotics and Biomedical Applications**, *DOCMEN Master Class*
Bar Ilan University, Israel, March 2017.

2016 **IEEE Sensors Council Summer School on Nano-Bio-Sensing for Distributed Diagnostics**, *Lecture on Bio-Inspired Electronics.*, École Politechnique Fédérale de Lausanne (EPFL)
EPFL Lausanne, Switzerland, July 2016.

2011–2012 **Tronics and MultiMEMS MEMS Processes**, *5 days Course, Accredited by the PhD School of Politecnico di Torino and EuroDOTS*, an introduction to MEMS Technologies and a detailed description of the industrial processes of Tronics and MultiMEMS, with application examples and hands-on sessions
Held in Italy, Belgium, Spain, Switzerland in the framework of the European Project Stimesi-2.

2012 **ElectroChemiLuminescence for Sensing**, *1 day Course*, with a description of the use of ECL for biosensing with examples of the sensors realized at the MiNES lab of Politecnico di Torino
HEIG-VD University of Applied Sciences of Western Switzerland, Yverdon, Switzerland, June 2012.

2011 **Nanoscale Elements for NanoElectronics and Sensing**, *1 day Course*, where were described the concepts of the use of nanodevices for electronics and sensing, with a detailed study of the systems realized at the MiNES Lab of Politecnico di Torino
Technical University of Munich, Germany, December 2011.

2006–2010 **Design your own microsystem**, *3 days Course*, an introduction to MEMS principles, technologies and applications, with details on the technology aspects, including design rules and key processes. Hands-On sessions about how to design a microsystem using CoventorWare
Course held in several countries: Italy, Romania, Malta, Israel, Hungary, Poland, Bulgaria, Slovenia in the framework of the European Projects Eurotraining-MST and MicroBUILDER.

2004–2008 **Systèmes électroniques numériques**, *Full Semester Course at Master Level*, for the LIFI Master Degree Curriculum, a French-Italian shared diploma. The course was an introduction to digital electronics with the design of the most important basic structures for digital computing
Course held at INP Grenoble to mixed French-Italian students.

Other Experience and Professional Memberships

2019 **Guest Editor**, *Special Issue "Bio-Inspired Micro and Nano Sensors and Biomedical Applications: from Transducers to Read-Out Circuits and Systems"*, MDPI Sensors

2018 **Session Chair**, *FoodCAS Special Session*, IEEE BioCAS 2018, Cleveland, OH, USA

2018 **Session Chair**, *Biomedical Sensing Instrumentation Circuits & Systems*, IEEE ISCAS 2018, Firenze, Italy

2018 **Member of Technical Committee**, *IEEE NewCAS 2018, International NEW Circuits and Systems Conference*, Montreal, Canada

2017 **Session Co-Chair, Biometrics & Biomedical Signal/Image Processing Circuits & Systems**, *ISCAS 2017*, Baltimore, USA

2013–2014, 2016–2017, 2020 **Member of the Program Committee**, *Annual DSD*, Euromicro Conference on Digital System Design

2016 **Guest Editor**, Transactions on Biomedical Circuits and Systems, Special Issue on BioCAS 2015, IEEE

2016 **Tutorials and Keynotes Co-Chair**, IEEE BioCAS 2016, Shanghai, China

2016 **Technical Program Chair of Special Session on Design of Cyber-Physical Systems**, DSD2016, Nicosia, Cyprus

2015 **Associate Editor, Section Bioinstrumentation, Biosensors and Bio-Micro/Nano Technologies**, *Annual IEEE EMBC (Engineering in Medicine and Biology) Conference*, Milan, Italy

2015 **Co-Chair of CMOS Lab-on-Chip Track**, IEEE ISCAS 2015, Lisbon, Portugal

2015 **Track Co-Chair, Analog circuits and systems**, *IEEE NewCAS 2015, International NEW Circuits and Systems Conference*, Grenoble, France

2015 **Scientific Committee**, *IEEE IWASI 2015, International Workshop on Advances in Sensors and Interfaces*, Bari, Italy

2014 **Special Session Chair Member, Bio-Inspired Circuits and Systems for Robotics**, IEEE BioCAS 2014, Lausanne, Switzerland

2014 **Technical Committee Member, Reviewer**, *Annual IEEE EMBS Micro and Nanotechnology in Medicine Conference*

2009–2014 **Technical Committee Member, Reviewer**, *Annual IEEE EMBC (Engineering in Medicine and Biology) Conferences*

2014 **Member of the Technical Program Committee**, *ISQED 2014*, 15^{th} International Symposium on Quality Electronic Design

2013 **Technical Committee Member, Reviewer**, *IEEE ISCAS 2013 Conference*

2012 **Associate Editor**, *Topic Issue for NanoBio-Europe 2013 Conference*, BioNanoScience, Springer

2013 **Member of the Technical Program Committee**, *Track 8, Sensors & Actuators*, ETFA, Emerging Technologies & Factory Automation, Cagliari, Italy

2012 **Guest Editor**, *Topic Issue for NanoBio-Europe 2012 Conference*, BioNanoScience, Springer

2011 **Member of the Scientific Committee**, *2011 Annual IEEE EMBC (Engineering in Medicine and Biology) Conference*

Languages

Italian	Mother tongue	
English	Excellent	*Written and Oral*
French	Excellent	*Written and Oral*

Additional information

Memberships

2008-today Member of the IEEE Engineering in Medicine and Biology Society (EMBS)

2011-today Member of the IEEE Circuits and Systems Society (CAS)

2009-2011 Member of the International Society of Electrochemistry (ISE)

Industrial experiences

1995-2006 **Founder of ISI Line Srl**, *Internet Service Provider*, Chief Executive Officer (CEO)

2000-2007 **Founder of Opla.com Ltd**, *E-Market for inter-companies good exchanges*, Member of the Board of Directors

2001-2006 **Founder of ReteItaly Srl (today Movimatica Srl)**, *VoIP and InfoMobility applications*, Chief Technical Officer (CTO)

Linux

2001 Founder of the Linux User Group of Torino

2004 Founder of the Linux User Group of Cuneo. President of the Association up to 2007

Recent Journals

[1] Andrea Prestia, Fabio Rossi, Andrea Mongardi, Paolo Motto Ros, Massimo Ruo Roch, Maurizio Martina, and Danilo Demarchi. Motion analysis for experimental evaluation of an event-driven fes system. *IEEE Transactions on Biomedical Circuits and Systems*, Under Publication:1–12, 2021.

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[4] I. Buraioli, D. Lena, A. Sanginario, D. Leone, G. Mingrone, A. Milan, and D. Demarchi. A New Noninvasive System for Clinical Pulse Wave Velocity Assessment: The ATHOS Device. *IEEE Transactions on Biomedical Circuits and Systems*, 15(1):133–142, 2021.

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