

Diego Liberati

Master in EE (83) and PhD in BioMedicalEngineering (87), do work for the main Italian governmental research body National Research Council ever since, being a chief scientist and research director in information, control and biomedical engineering since 1999, at the highest seniority since 2015

Did work ever since on natural and artificial intelligence, with emphasis on:

- Central Nervous System first;
- then also Autonomous Nervous System control on cardiovascular system;
- then also Endocrine System slow Control on organism;
- then also in the beautiful interplay among genes and proteins within the cell
- then also in conjugating statistical inference (like NN&LS) with traditional math deduction through standard Schroedinger equations, especially in physical chemistry of biomolecules: both drug discovering and modeling signaling among cells, like Tumor Necrosis Factor induced apoptosis or resilience - depending on the target cell status, in the so called bystander effect in radiotherapy - as well as discovering mutants of onco-suppressors like Sos1 by Galerkin simulation of its domani dynamics (Biotechnology advances 2009)

Did work on NN&LS related topics since the last decade of past century until 2020 as detailed below, with emphasis on

- Mentoring, among dozens of others, PhD thesis of Cesare Alippi, now Professor at both Politecnico di Milano and University of Italian Swiss, where is also deputy Rector and Director of the (joint with Scuola Universitaria Professionale della Svizzera Italiana) Delle Molle Institute for Artificial Intelligence

- Pioneering ANN for Brain Computer Interfacing with the then pupil Fabio Babiloni in Rome University (Computers and Biomedical Research 2000)

- Developing Logical Networks for clustering binarized variables, with the then pupil Marco Muselli in Genova National Research Council of Italy (IEEE Trans CaS I, 2000) (IEEE Trans KDE 2002), kind of NN where the hyperplanes - piece-wise clustering data - are orthogonal to the codified variables. Besides fast learning, they infer clustering rules in the human intelligible predicate logic form of OR or ANDs, thus pioneering the nowadays fashionable eXplainable AI within its most solid branch, ML. Have been serving for a while as Associate Editor Europe for IEEE Transactions on Professional Communications, trying, without real success I have to confess, to introduce a bit of Science or at least Engineering in that community of writers.

- Developing piece wise affine identification via multi-variable regression within the framework of the hybrid logic and dynamic systems with then pupil Giancarlo Ferrari Trecate post doc at ETHZ, now Professor at EPFL, in case data are time ordered dynamically as signals. For that achievement, the great Indian mathematician Swami Laxminarayan, founding Editor, named me founding Associate Editor of Nonlinear Analysis: Hybrid Systems

- Developing a simple iterated cascade of PCA and K-means in order to cluster when a single hyperplane in the ortho-normalized space is sufficient (Intelligent Data Analysis 2007) like in discriminating acute Lymphoid form Myeloid leukemias, outperforming MIT (Golub et al, Science 1999) and discovering a misclassification by them, then reported. Nitish Tahor, mentor

and friend, former Editor in chief of Springer Medical and Biological Engineering and Computing, named me among his Associate Editors

In 2020 four events (the second of which common to many human beings) happen, switching for a couple of years my intense scientific activity:

1. Have been designated scientific attaché to the Italian Embassy in Belgrade: as a Public Servant, I felt honored: Belgrade is not Washington, but still our Eastern European Embassy with a scientific attaché besides Mosca (that I had being offered too, almost as prestigious as USA, but refused, already forecasting what it would have happened with Ukraine) in a country full of bright woman engineers and scientist as the wife of one of my former pupils, Paolo Ienne, Professor at EPFL.

2. Covid 19 forced everybody in Italy to home working since beginning of march, then half week home working since September

3. My then 94th years old father got so fragile that I had the authorization to full time home working until September 2022 when he quietly died in my arms.

4. My fragile only younger brother, already proved by our mother and his mother-in-law cancer and Alzheimer's death, also needed not only economical but, more important, familiar care, being me the only close relative still active and then alive

Like a mother with her newborn, I decided to devote the necessary months to them: did also refuse the scientific diplomacy new career in order not to leave them. Now my brother seems quite over, am full time back to science, ready also for new stimulating assignments, like hopefully to help you as your Associate in IEEE Trans NN&LS, for which, as well as for many other transactions and for other top Journals have been serving as reviewer. It is far from my policy to be member of anything, sorry: even when I have been Secretary of the Biomedical Engineering Society of AEIT (Italian IEEE) I asked and obtained to do that, for decades, without being a regular member; same when I have been president of both a ONG caring for people in sorrow and a cultural movement.

Within neural networks and learning systems I could handle mainly the following 4 areas of expertise (relevant publications from CV are indicated in each of the areas selected):

Machine Learning (IEEE Transactions on knowledge and Data Engineering 14 (6), 1258-1268, 2002) (IEEE Transactions on Circuits and Systems I: Fundamental Theory and Applications 47(4): 513-527, 2000)

eXplainable AI (IEEE Transactions on knowledge and Data Engineering 14 (6), 1258-1268, 2002) (IEEE Transactions on Circuits and Systems I: Fundamental Theory and Applications 47(4): 513-527, 2000)

Clustering (Frontiers in Oncology 9, 532, 2019) (Plos one 4 (1), e4299, 2009) (Intelligent Data Analysis 11 (2), 175-188, 2007) (IEEE Transactions on knowledge and Data Engineering 14 (6), 1258-1268, 2002) (IEEE Transactions on Circuits and Systems I: Fundamental Theory and Applications 47(4): 513-527, 2000)

Data (signals) Regression (Nonlinear Analysis: Hybrid Systems 3 (4), 708-712, 2009) (Annals of biomedical engineering 37, 1871-1876, 2009) (Nonlinear Analysis: Hybrid Systems 2 (4), 1217-1221, 2008) (Neuroimage 37 (1), 189-201, 2007) (Automatica 39 (2), 205-217, 2003)

In more detail, until the beginning of the pandemic in march 2020, have been:

born in Milano (Italy) in December 1958

educated in the Politecnico di Milano, where I received my Master in Electrical Engineering and Computer Science, summa cum laude, on February 2 , 1983.

since 1984 with the Italian National Research Council, where I am currently Research Director since 1999, at the highest seniority since May 1st 2015 having won a national competition among all disciplines. Have been in charge of the Genova section and member of the Board within the Institute for Electronic and Information & communication Technologies, as well as member of the presidential Foresight Group and of the presidential committee designing the ICT Department.

In 1988 the Italian Ministry for Scientific Research awarded me the first Italian Research Doctorate in Biomedical Engineering

Associate to Italian National Nuclear Physics Institute (and formerly head of the Virtual Biophysics Lab at Milano Bicocca Section), Secretary of the Biomedical Engineering Society of the Italian Electrical and Electronic Engineering Association (and Milano prize laureate in 1987) and member of the Technical Committee on Control Design of the International Federation of Automatic Control, heading the working group on neural control, have chaired the Scientific Committee for the Conferences on Information and Control Technologies in Health Systems sponsored by the Italian Control Association and has been a technological transfer expert with the Milano Chamber of Commerce.

Visiting scientist at Rockefeller University (NIH grant), New York University (Brain Research Lab: Neurometrics, with E.Roy John), University of California at Berkeley (Telerobotic and Neurology, with Lawrence Stark, in turn Wiener's pupil) and International Computer Science Institute (Artificial Intelligence, with Jerome Feldman and Steve Omohundro), have directed joint projects granted by both private and public institutions, like: ROBO MD for elderly tele-assistance in the Innovation for Welfare EU framework; Neural Plasticity; Artificial Neural Networks inspection of cold contact with Hewlett Packard..

Having taught signal processing, mathematical modeling, microelectronics, lab instrumentation, control theory and data mining in European Universities, have mentored dozens of pupils toward and beyond their doctorate

Past President of the Milano council within both a Charity ONG and an International Cultural Movement, am familiar with high level personal and institutional interactions. Have been the Italian candidate to the vice-presidency of the European Patent Office.

My main scientific interests in Information and Communication Technologies for life are related to measurement analysis, model identification and synthesis of bio-mimetic emulations in natural and artificial complex systems, whose scientific and ethical aspects involving the human beings do love to deal with.

Personal

Born in Milano, Italy. Italian citizen, Male, Single

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Email: diego.liberati@gmail.com

Education

1977: Bachelor of Science, Einstein College, Milan, Italy

1983: Doctor, Electrical Engineering & Computer Science, Politecnico di Milano, Italy

1988: PhD Biomedical Engineering, Politecnico di Milano, Italy

Professional history

1999-permanent: Research Director: Information, Control & Biomedical Engineering, Italian National Research Council @ Politecnico di Milano

1984-98: Senior Scientist: System Theory,
Italian National Research Council @ Politecnico di Milano

1982-83: Professor, Computer Science, Radio-technical Institute, Milan

1978-81: Professor, French, Einstein College, Milan

Awards:

1983: Italian College of Engineering: Chartered Engineer

1983: Italian Ministry of Education: Research Doctorate Fellowship

1984: St Vincent de Paul international charity: President, Milan region Council

1985: Gini Foundation of Padua University: International Research

1985: Italian Association Automatic Machinery: Image Processing

1986: New York University: Visiting Scientist, Brain Research

1986: NIH & Rockefeller Univ: Biomedical Lab Computing

1987: Rotary International: Leadership Award
1987: Italian Electrical Association: Milan Award
1987: Politecnico di Milano: Professor, Math Modeling
1988: Italian Ministry of Education: Research Doctorate
1988: NATO: International Research Fellowship
1988: University of California at Berkeley: Visiting Scientist
1989: University of Perugia: Professor, Microelectronics
1990: Politecnico di Milano: Professor, Signal Processing
1990: Patra University: Professor, Signal Processing
1991: Italian Electrical Association: Secretary, Bioengineering
1991: University of Milan: Professor, Laboratory Instrumentation
1992: NATO: Senior International Research Fellowship
1993: Intern. Computer Science Institute: Senior Visiting Scientist
1993: NATO: Senior International Research Fellowship
1993: International Catholic Intellectuals: President of Milan Council
1994: Milan Chamber of Commerce: Innovation Plaza Award
1997: Italian National Research Council: Principal Scientist
2001: Politecnico di Milano: Professor of Automatic Control
2007: Politecnico di Torino: Professor Physiological Modeling
2009: Italian National Nuclear Physics Institute: Associate Scientist
2009: Politecnico di Milano, PhD School: Professor of Modelling and Simulation in Life Sciences

2009: Politecnico di Milano, PhD School: Professor of Data Mining and Modelling Large Data Sets

Selected Publications (peer-reviewed cited papers in archive journals):

Annals of Biomedical Engineering 28:1131-1145, 2000 37(9):1871-1876, 2009
Automatica 39: 205-217, 2003
Biological Cybernetics 56: 111-120, 1987 78: 71-78, 1998
Biotechnology Advances 30: 154-168, 2012

Cell Proliferation 32 (1):39-48,1999 33:219-229, 2000
Circulation 83(4)II:43-51,1991
Clinical Endocrinology 46:387-395, 1997 52(6):703-712, 2000
Clinical Physics and Physiology Measurements 12(A):43-47,1991
Computers and Biomedical Research 19:520-534,1986 33:59-74, 2000
Clinical Neurophysiology S40:8-12,1987 S41(4):28-33,1990 106:229-237,1998

European Journal of Endocrinology 141(3):246-256, 1999 14 (3):323-332, 2002

IEEE Engineering in Medicine and Biology Magazine 11(2):80-84,1992

IEEE Pulse May/June: 41-54, 2011

IEEE Transactions on Biomedical Engineering 35:701-11,1988 38:879-90,1991
39:943-51,1992 40:440-55,1993 42:678-87,1995 49:782-7, 2002

IEEE Transactions on Circuits and Systems, I 47(4):513-527, 2000

IEEE Transactions on Knowledge and Data Engineering 14(6):1258-1268, 2002

Il Nuovo Cimento 31 C (1): 109, 118, 2008

Intelligent Data Analysis, 11(2):175-188, 2007

International Journal of Psychophysiology 16:163-174,1994

Journal of Autonomic Nervous System 35(1):33-42,1991

Journal of Biomechanics 29(4):475-481, 1996

Journal of Biomedical Engineering 8(3):244-254,1 9(1):3-12,1987 11:285-292,1989
14:57-64,1992

Medical and Biological Engineering and Computing 29:159-166,1991 35:124-130,1997
37:391-395,1999 37:537-542,1999 38:109-112,2000 38:483-486,2000

Methods of Information in Medicine 33:28-31, 1994

NeuroImage 37: 189–201, 2007

Nonlinear Analysis: Hybrid Systems 2:1217-1221, 2008 3 :708–712, 2009

PLoS One 4(1): e4299, 2009. (doi:10.1371/journal.pone.0004299)

Signal Processing 9: 25-35, 1985

Professional expertise

Field: Natural and Artificial Complex Intelligent Systems

Selector and supervisor of associates.

Invited Speaker and Chairman in Seminars and Conferences. Instructor and Director of Courses. Editor of Proceedings. Reviewer for international Research Grants and journals.

Editor of books on information and control technologies for health. Member of the Editorial Board of archive Journals

Principal Investigator in granted joint research projects:

Markov Models of Scan-path, with University of California at Berkeley

Learning Strategies in Impaired Children, with University of Milan

Sustained Attention in Impaired Children, with Medea Institute

Bi-coherence in Neuro-sensory Plasticity, with University of Lausanne

Bi-coherence Analysis of Mechano-myogram, with University of Brescia

Pre-Motor Brain Activation, with University of Roma La Sapienza
Pre-Injury Spinal Cord Monitoring, with Naval Bio-dynamics Labs, US Navy

Single Trial Evoked Potentials Monitoring, with New York University

Single Trial Magneto-Encephalographic analysis, with Univ of Roma II Tor Vergata

Single Trial fMRI analysis, with University of Modena

Electro-Encephalogram Monitoring, with Neurological Institute, Milan

EEG Coherence in hepatic encephalitis, with University of Padova

EEG Coherence in Alzheimer's & Epilepsy, with S. Raphael Hospital, Milan

Electro-Retinogram Assessment of Diabetic Retinopathy, with S. Raphael Hospital, Milan

Coherence analysis in Autonomous Nervous System under Stress, with University of Milan

De-convolution Models of Hormone Secretion, with University of Pavia

Compartmental Kinetics of Drugs, with Verona Hospital

Compartmental Modeling Dialysis, with Hammersmith Hospital, London

Qualitative Modeling of Dialysis, with Turin Institute of Technology

Expert Systems in Clinical Laboratory Validation, with Instrumentation Laboratory

Neural Networks in Image Processing, with Hewlett-Packard

Neural Networks in Vegetal Pathology, with University of Milan

Neural Networks in Transplant Assessment, with Polyclinic Hospital, Milan

Identification of prognostic factors in oncology, with Italian Cancer Institutes

Network on Rare Cancer, with Italian Cancer and Italian Health Institutes

Modeling Cancer growth, with University of Verona

Piecewise affine identification of hybrid systems, with Zurich Institute of Technology

Micro-arrays data mining, with Politecnico di Milano

Data mining in drug discovery, with pharmaceutical companies

Cooperative e-Science over internet through Web services, with University of Cagliari

Systems biology, with University of Milano-Bicocca

Virtual Biophysics Lab, with Italian National Institute of Nuclear Physics

ROBO MD within the Innovation for Welfare program of the European Union

Hystory:

Since May 1984 he is with the Italian National Research Council (***since February 1999 Research Director***) within the Electronic, Information and Communication Technology Institute at Politecnico di Milano, Italy since its constitution in 2001. Within the Model & Control System project, he leads the Information & Control for Systems Biology subproject, whose scientific goals are presently mainly aimed to networks and protocols for process automation and control, complex systems modeling, identification and control, bioinformatics, systems biology and patho-physiology, technology for life, brain-computer-interfacing.

In 2006 he has also been in charge of the Genoa section.

From the constitution in 2003 to 2009 he has been member of the Board of the Institute.

In 2005 he has been Member of the Board of the Preparatory Committee for ICT Department within CNR From 2009 to 2015 Associate to Italian National Nuclear Physics Institute at Milano Section, and responsible for the project Virtual Biophysics Lab – Radiobiology at Milano Bicocca Section

Member of the Control Systems Design Technical Committee within the International Federation for Automatic Controls and Head of the working group on Neural Control.

Reviewer, (associate) editor and member (or president) of the scientific committee for international research grants, journals, like presently Medical & Biological Engineering and Computing, and conferences, Dr Liberati keeps mentoring students toward and beyond their master and doctoral degree.

In **2009-2010** he has also been Professor of Mathematical Modeling in Life Science and of Data Mining and Modeling Large Data Sets at the PhD School in Information and Communication Technologies at Politecnico di Milano.

From 2007 to 2009 he has also been Professor of Mathematical Modeling of Physiological Systems at Politecnico di Torino

From 2001 to 2006 he has been Professor of System Theory and Automatic Control in the Biomedical, Managerial and Aeronautical Engineering curricula within the Politecnico di Milano;

Form 1994 to 1998 he acted as Expert for Biomedical Engineering and Clinical Applications within the frame of the Innovation Plaza of the Milano Chamber of Commerce, developing technological transfer from Politecnico di Milano to small and medium companies

From 1993 to 1996 he has been the President of the Milano Council within the International Movement of Catholic Intellectuals: also elected in the Italian national board, he led a dynamical group of young professionals to integrate with a more traditional consolidated structure, facing multiculturalism also through different religions.

From 1990 to 1996 he has been a Professor of Signal Processing at the Politecnico di Milano

From 1991 to 1996 he has been a Professor of Laboratory Instrumentation at the University of Milano

In **1993** he has been Senior Visiting Scientist at the International Computer Science Institute, Berkeley, California, United States

From 1989 to 1992 he has been the first Professor of Microelectronics within the newly created Faculty of Engineering at University of Perugia, Italy

In **1990 -1991** he has been Professor of Signal Processing at University of Patra, Greece

From 1987 to 1991 he has been Professor of Pharmacokinetics and Mathematical Modeling at Politecnico di Milano

From 1998 to 1991 he has been a Member of the information technology committee of the Electrical Engineering and Computer Science Department of the Politecnico di Milano, contributing to the choice and implementation of the new multi-platform computing network.

In 1988 -1989 he has been Visiting Scientist in the Tele-robotic Unit of the University of California at Berkeley, been involved in research on natural and artificial vision, with emphasis on scan-path under the Head, the late Professor Lawrence Stark

From 1984 to 1988 he has been the President for the Milano region of the International Charity: Society of Saint Vincent de Paul, motivating and leading a few thousands of volunteers through a dozen of direct reports and a few staff, directing the strategic management of the budget and of the estate, interacting with the regional government on the regulation for the not for profit sector, and with the media to improve communication on the mission

In **1986** he has been Visiting Scientist at the Brain Research Institute of New York University, being involved in research on a NATO grant about peroperatory monitory of neural integrity via single evoked potential computer processing under the Director, Professor Erwin Roy John

In **1983 - 1984** he has served as Chief Ballistic in the historical Horse Artillery within the Italian Army, directing ballistic computation and developing a corrected simpler computing method

In **1982 - 1983** he has been Professor of Computer Science at the Milano Institute of Radio-Technology, teaching assembler programming for the Digital Equipment Corporation PDP computer as an introduction to computer science for continuous education of undergraduate technical employees of Italtel.

From 1978 to 1981 he has been Professor of French at the Einstein College, Milano, Italy

Scientific achievements, in collaboration with:

- the Ecole Polytechnique Fédérale de Lausanne, having won a CNR short term mobility 2017 to interact in January 2018 with former pupil Giancarlo Ferrari-Trecate, now professor there, about statistical approaches to inverse problems, with special attention to electrophysiology
- the Univeristy of Linz and a few others in Europe having won the ROBO MD grant within the EU Innovation 4 Welfare framework in order to tele-assist the elderly at home via wireless monoring of both Heart Rate Variability and

Ballistosignals through an intelligent autonomous robot interacting with both the elderly and when needed to the remote operating center: its result will be furtherly presented to the conference about Sustainable Growth in Wroclaw (Poland) in 2018

- the Parini (classical) and Einstein (scientific) High Schools (among the top ones in Milano) as for a “work-school alternance” project half 2017 aiming to introduce 4 among the very best students of the two “Licei” to scientific research through a first approach to a very rare disease, the sudden capillary leaking syndrome, affecting a dear colleague in Politecnico di Milano.
- the Politecnico di Milano in 2016 as for [Modeling Rain Fields for Earth Space Propagation Applications by an Autoregressive Modeling Approach](#) presented at the 8th Advanced Satellite Multimedia Systems Conference (ASMS) in Palma di Maiorca (Spain)
- the Russian Academy of Science about [Identification of incoherent electrical signals obtained at compact underground multi-electrode sensor preceded strong earthquakes](#): a bilateral project has been proposed to CNR for next years
- the Rabat Telecommunication Institute in Moroc about Data Mining and Kalman Filtering for tracking and navigation of autonomous vehicles when loosing GPS signal: a bilateral project has been proposed to CNR for next years
- the Massachusset Institute of Technology and the Politecnico di Milano since 2016 as for a Lotka-Volterra like model of the human-robot interaction at work, aiming to show from data that the cooperating interactive effect is everywhere but in Italy predominant against the competition loosing employment: in the rest of the industrialized world, robot seem instead to push workers to be more skilled, pushing them to improve their skills either requalifying existing employees or assuming more qualified ones while caring about the correct downstepping of the not requalifyables.
- Politecnico di Milano and University of Milano Bicocca St Gerard Hospital Monza in 2016 about [A quantitative numerical model for TNF-alpha mediated cellular Apoptosis](#) published as a book chapter.
- Politecnico di Milano and Vita e Salute University St Raphael Hospital Milano in 2016 as for Clustering of pancreatic endocrine tumors via microarray gene expression analysis published as a book chapter
- Fincantieri about energy harvesting and sleep analysis on boats (E-cabin project since 2016)
- the Politecnico di Milano, with professor Carlo Piccardi and a couple of undergraduate students in fulfillment of their bachelor about Community analysis

in the gene-protein interaction, aiming at simplifying the Page ranking approach to systems biology since 2014

- the University of Cagliari as for [A framework for networked experiments in global e-science: Perspectives for e-learning in global contexts](#), a 2013 book chapter dealing with both e-science and e-learning in designing web services better enabling scientist to cooperate remotely
- the University of Milano-Bicocca, as for mathematical modeling of competitive inter-domain interactions in cell metabolism (Biotechnology Advances 30: 154–168, 2012)
- the Politecnico di Milano, as for biomedical signal and image processing (IEEE Pulse May/June: 41-54, 2011)
- - the Bioimaging and Neuroscience Institute of the Italian National Research Council as for cortical firing motifs characterization in chronic pain (PLoS One 4(1): e4299, 2009. (doi:10.1371/journal.pone.0004299))
 - the Universities of Trieste and of Verona as for modeling cell population dynamics (IL NUOVO CIMENTO, 31 C (1): 109-118
 - the Politecnico di Milano, as for machine learning and rule extraction from data mining (INTELLIGENT DATA ANALYSIS, 11(2):175-188, 2007)
 - the University of Modena, as for detecting intention through functional Magnetic Resonance Imaging (NEUROIMAGE 37: 189–201, 2007)
 - the University of Cagliari and the Politecnico di Milano as for co-operative e-Science on Internet through Web services possibly on Grid (Lecture Notes in Computer Science, Volume 3812, pp. 281 – 292 Springer-Verlag, 2006)
 - the University of Pavia, the French Institute for Information and Automation in Paris and the Zurich Institute of Technology, as for piecewise affine systems identification (AUTOMATICA 39 (2): 205-217 FEB 2003);
 - the Genova unit of the Institute, as for machine learning and rule extraction from data mining (IEEE T KNOWL DATA EN 14 (6): 1258-1268 NOV-DEC 2002);
 - the University of Pavia and the Auxologic Italian Institute as for de-convolution models of hormone secretion (EUR J ENDOCRINOL 147 (3): 323-332 SEP 2002)
 - the Italian Cancer Institute and the Electronic Circuits Institute as for forecasting patient recovery (IEEE T BIO-MED ENG 49 (8): 782-787 AUG 2002
- - the Italian Cancer Institute and the University of Pavia on identifying prognostic indices for patient under composite treatments (MED BIOL ENG COMPUT 38 (5): 483-486 SEP 2000);
 - the University of Verona on studying the dynamics of cancer growth (CELL PROLIFERAT 33 (4): 219-229 AUG 2000);
- the University of Pavia, the Auxologic Institute, the University of Milano and the University of Virginia on de-convolution techniques). (ANN BIOMED ENG 28 (9):

1136-1145 SEP 2000) for hormone secretion assessment (CLIN ENDOCRINOL 52 (6): 703-712 JUN 2000).

- the machine learning project within the Institute on a new technology for rule extraction from data mining (IEEE T CIRCUITS-I 47 (4): 513-527 APR 2000);

- the University of Rome, the Fatebenefratelli Hospital in Rome and the Helsinki University on pre-motor brain activation toward brain computer interfacing (COMPUT BIOMED RES 33 (1): 59-74 FEB 2000);

- the University of Milano on studying the dynamics of oospore germination in plant pathology (MED BIOL ENG COMPUT 38 (1): 109-112 JAN 2000)

- University of Pavia, Auxologic Institute and University of Virginia on deconvolution approach to hormone secretion assessment (EUR J ENDOCRINOL 141 (3): 246-256 SEP 1999);

- Hammersmith Hospital on modeling dialysis (MED BIOL ENG COMPUT 37 (3): 391-395 MAY 1999);

- University of Verona on modeling (MED BIOL ENG COMPUT 37 (4): 537-542 JUL 1999) tumour growth (CELL PROLIFERAT 32 (1): 39-48 FEB 1999).

- University of Milano and University of Brescia on corrected conditional entropy and regularity of sympathetic outflow (BIOL CYBERN 78 (1): 71-78 JAN 1998);

- St Raphael Hospital and University of Milano on Electroencephalographic coherence in Alzheimer's disease (ELECTROEN CLIN NEURO 106 (3): 229-237 MAR 1998).

- University of Milano on Electroencephalographic total and partial coherence (MED BIOL ENG COMPUT 35 (2): 124- 130 MAR 1997)(Yearbook of Medical Informatics: 331-337, 1998);

- University of Lausanne, University of Salamanca, Conseil National des Recherches Scientifiques at Orsay, under the framework on the European Union network on neural plasticity, as for higher order analysis of the Electroencephalogram (J PHYSIOL-LONDON 493P: S20-S21 MAY 1996);

- University of Brescia on bi-spectral analysis of mechano-myogram (J BIOMECH 29 (4): 475-481 APR 1996);

- Instrumentation Laboratory on Expert Systems in Validation in 1995

- Hewlett-Packard on Neural Networks in Image Processing and Pattern Recognition for Factory Automation in 1994;

- Italian Air Force on artificial neural networks in aero-medical decision making (AMP Symposium on the clinical basis for aero-medical decision making, 1994)

- University of Milano on neural network detection of single evoked brain potentials (Neural Networks in Biomedicine: 277-286, Masulli F., Morasso P.G., Schenone A. eds, World Scientific, Singapore, 1994)

- University Hospital of Milano on neural networks in forecasting the outcome of kidney

- transplantations (AEI AUTOM ENERG INF 81 (7-8): 733-736 JUL-AUG 1994);
- University of California at Berkeley through a NATO grant, International Computer Science Institute and Rho Hospital on Markov-chain modeling of performances during a skilled performance task (INT J PSYCHOPHYSIOL 18 (2): 98-99 NOV 1994)(J PSYCHOPHYSIOL 9 (1): 88 1995);
 - Rho Hospital on single-sweep analysis of movement-related brain macro-potentials (INT J PSYCHOPHYSIOL 16 (2- 3): 163-174 MAY 1994);
 - University of Rome on multi-channel autoregressive with exogenous input identification of brain evoked potentials (METHOD INFORM MED 33 (1): 28-31 MAR 1994);
 - University of Pavia on de-convolution of hormone time series(IEEE T BIO-MED ENG 40 (5): 440-456 MAY 1993) and application to growth hormone (IEEE T BIO-MED ENG 42 (7): 678-687 JUL 1995) with Auxological Institute (CLIN ENDOCRINOL 46 (4): 387-395 APR 1997);
 - Verona and Legnago Hospitals on compartmental modeling of dialysis (MED BIOL ENG COMPUT 31 (2): 171-179 MAR 1993);
 - Politecnico di Torino on qualitative modeling of dialysis (IEEE ENG MED BIOL 11 (2): 80-84 JUN 1992);
 - University of Rome on dynamic behavior of evoked magneto-encephalogram (CLIN PHYS PHYSIOL M 12: 43-47 Suppl. A 1991)(J BIOMED ENG 14 (1): 57-63 JAN 1992);
 - University of Milano in assessment of neural control during computing task (J. Ambulatory Monitoring, 1 (3): 241- 250, 1988) and mental stress (J AUTONOM NERV SYST 35 (1): 33-42 JUL 1991) (CIRCULATION 83 (4): 43-51 Suppl. S APR 1991) through spectral analysis of hearth rate variability;
 - University of Milano (ELECTROEN CLIN NEURO : 28-33 Suppl. 41 1990) on topographic mapping of single evoked brain potentials (IEEE T BIO-MED ENG 39 (9): 943-951 SEP 1992);
 - Politecnico di Milano on modeling cortico-cortical interaction in multi-sensory evoked potentials (IEEE T BIO-MED ENG 38 (9): 879-890 SEP 1991);
 - Politecnico di Milano on time-varying modeling of single evoked brain potentials (MED BIOL ENG COMPUT 29 (2): 159-166 MAR 1991);
 - Politecnico di Milano and University of Milano on parametric modeling of single evoked brain potentials (Biological Cybernetics, 56: 111-120, 1987)(EEG & Clin. Neurophys., S40: 8-12, 1987)(IEEE Trans. BME , 35 (9): 701-711, 1988)(J. Biomed. Eng. 11: 285-292, 1989);
 - Italian Neurological Institute, and New York University through a NATO grant, on electroencephalogram monitoring in neurosurgery (Signal Processing, 9: 25-35, 1985) (J. Biomed. Eng., 9 (1): 3-12, 1987);

- Politecnico di Milano on Wiener filtering of brain evoked potentials (J. Biomed. Eng., 9 (1): 3-12, 1987);
- Politecnico di Milano and University of Brescia on linear filtering and parametric identification for biomedical signal processing (J. Biomed. Meas. Inform. Contr., 1 (3): 111-125, 1986)(Biocybern. & Biomedic. Engin. 7 (1-4): 69-86, 1987);
- Verona Hospital on compartmental modeling of pharmaco-kinetics (Measurement in Clinical Medicine: 221-227, IMEKO Press, Edimburgh, 1986)
- Universities of Milano and of Brescia in parametric cross-spectral analysis of heart variability signals (Computers and Biomed. Res., 19: 520-534, 1986)

Doctoral Thesis mentored

- Mariani e Nicoletta: Gene-Proteins Interaction Networks Modeling
- S.Rodella: Near InfraRed Spectroscopy in investigating self regulation in headache
- D.Calamari: Clustering neuronal tracing in pain circuit analysis
- G.Corti: Control of Brain Intensive Care
- R.Melchiotti: Identification of salient genes discriminating neural tumours

- L.Scamazzo: Data mining for drug discovery
- P.Maffezzoli: Unsupervised clustering of DNA micro-arrays data
- V.Tansini: EEG detection of movement intention
- F.Rippa, D.Tango: Accuracy in multi-modal bio-imaging registration
- R.Corrado, D.Gaioni: Quality control in audiological diagnostic instrumentation**
- C.Scurati: Web-based tele-consultation in oncology
- M.Pisciotta: Neural activity coupled with microelectrodes matrices analysis**
- A.Di Giuseppe: Induced hormone secretion in Growth Hormone deficits
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- V.Cutrona, D.Borsotti: Single-event fMRI**
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- M.Moro: Models of pituitary hormone interactions
- M.Bellan: Compartmental modeling in dialysis
- I.Daniele: Multivariate assessment of physiological states

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- C.Crivelli: Imaging in telepathology
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- M.Marini: Pathophysiology of multivariate differential thermometry

- P.Lomazzi: Cerebral rhythms and states in performing actions
- M.Molli: Partial coherence of hormonally-related neuroplasticity

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G.Floridia: Time Decorrelation of Brain Evoked Potentials
P.Barbarini, C.Malara: Coherence Analysis in HepatoEncephalography

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