

Ing. Ettore Lanzarone, PhD

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Education

Ettore Lanzarone was born in Milan, Italy, in 1979.
He obtained his Ph.D. in bioengineering in June 2008 at the Politecnico di Milano, his master degree in biomedical engineering cum laude in April 2004 at the Politecnico di Milano, and his scientific high school degree in July 1998 (mark 60/60).

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Affiliations

Since November 2011 he is a permanent researcher at the division in Milan of the Institute of Applied Mathematics and Information Technology (IMATI) of the National Research Council of Italy (CNR).

He is part of the β -Lab (Laboratory of Biomechanics for Endovascular Treatments of the Aorta), joint laboratory among Università degli Studi di Pavia, CNR-IMATI and Policlinico San Donato.

He is member of the European Working Group on Operational Research Applied to Health Services (ORAHS), of the European Network for Business and Industrial Statistics (ENBIS), of the European Society of Biomechanics (ESB), of the Italian National Bioengineering Group (GNB), and of the Italian Association of Mathematical Engineers (AIM).

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Research activity

His main research interests are:

- **Optimization of resource planning in healthcare facilities**, with particular interest in including the robustness in the plans, to face the high uncertainty of patients' demands.
 - **Stochastic models** for estimating the demand and planning the activities in healthcare structures.
 - **Scheduling algorithms** for the manufacturing industry.
 - **Industrial bioengineering**, with particular interest to the cardiovascular fluid dynamics (modelling studies, in-vitro studies, clinical trials and design of bench prototypes for the cardiovascular system) and the application of innovative biomedical devices and methodologies in the processes of healthcare facilities.
 - **Parameter estimation and stochastic evolution of complex dynamic systems** described by ordinary differential equations and partial differential equations.
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Previous affiliations and activities

Previously, he was a research fellow at the Department of Mechanics of the Politecnico di Milano: from January 2011 to November 2011 he worked for the project “ADI-plan: methods and tools for resource planning and control in networks of integrated home care” cofounded by Regione Lombardia within the program Dote Ricerca Applicata and from April 2008 to September 2010 for the project “Analysis and design of logistic and organizational systems for delivering social and health services in the territory”.

Moreover, he was collaborator at the MUSP Consortium (Consorzio Macchine Utensili e Sistemi di Produzione, Piacenza, Italy) from October 2010 to January 2011 and collaborator at the Department of Mechanics of the Politecnico di Milano in March 2008.

During the Ph.D. period (March 2005 - February 2008) he worked at the Laboratory of Biological Structures Mechanics (Structural Engineering Department, Politecnico di Milano) and the Biomachine Laboratory (Bioengineering Department, Politecnico di Milano).

From July 2004 to May 2005 he performed the compulsory civil service in replacement of military service at Casa di Nazareth.

Publications

International journals indexed in ISI or SCOPUS

- L. Martín-Fernández, E. Lanzarone. **A particle-filtering approach for real-time estimation of thermal conductivity and temperature tracking in homogeneous masses**. Numer Heat Tr B - Fund 2015; DOI 10.1080/10407790.2014.992060; ISSN 1040-7790.
- R. Argiento, A. Guglielmi, E. Lanzarone, I. Nawajah. **A Bayesian framework for describing and predicting the stochastic demand of home care patients**. Flex Serv Manuf J 2015; DOI 10.1007/s10696-014-9200-4; ISSN 1936-6582.
- B. Addis, G. Carello, A. Grosso, E. Lanzarone, S. Mattia, E. Tànfani. **Handling uncertainty in health care management using the cardinality-constrained approach: advantages and remarks**. Operations Research for Health Care 2015; 4(1): 1-4; ISSN 2211-6923.
- F. Auricchio, M. Conti, A. Ferrara, E. Lanzarone. **A clinically-applicable stochastic approach for non-invasive estimation of aortic stiffness using computed tomography data**. IEEE T Bio-Med Eng 2015; 62(1): 176-87; ISSN 0018-9294.
- E. Lanzarone, S. Pasquali, V. Mussi, F. Ruggeri. **Bayesian estimation of thermal conductivity and temperature profile in a homogeneous mass**. Numer Heat Tr B - Fund 2014; 66(5): 397-421; ISSN 1040-7790.
- L. Ironi, E. Lanzarone. **Assigning probabilities to qualitative dynamics of gene regulatory networks**. J Math Biol 2014; 69(6-7): 1661-92; ISSN 0303-6812.
- G. Carello, E. Lanzarone. **A cardinality-constrained robust model for the assignment problem in home care services**. Eur J Oper Res 2014; 236(2): 748-62; ISSN 0377-2217.
- E. Lanzarone, A. Matta. **Robust nurse-to-patient assignment in home care services to minimize overtimes under continuity of care**. Operations Research for Health Care 2014; 3(2): 48-58; ISSN 2211-6923.
- L. Martín-Fernández, G. Gilioli, E. Lanzarone, J. Míguez Arena, S. Pasquali, F. Ruggeri, D.P. Ruiz Padillo. **A Rao-Blackwellized particle filter for joint parameter estimation and biomass tracking in a stochastic predator-prey system**. Math Biosci Eng 2014; 11(3): 573-97; ISSN 1547-1063.

- E. Lanzarone, F. Ruggeri. **Inertance estimation in a lumped-parameter hydraulic simulator of human circulation.** J Biomech Eng - T ASME 2013; 135(6): 061012; ISSN 0148-0731.
- E. Lanzarone, A. Matta, E. Sahin. **Operations management applied to home care services: the problem of assigning human resources to patients.** IEEE T Syst Man Cy A 2012; 42(6): 1346-63; ISSN 1083-4427.
- E. Lanzarone, A. Matta. **A cost assignment policy for home care patients.** Flex Serv Manuf J 2012; 24(4): 465-95; with Electronic Companion; ISSN 1936-6582.
- E. Lanzarone, R. Vismara, G.B. Fiore. **Response to the letter to the editor: a new pulsatile volumetric device with biomorphic valves for the in vitro study of the cardiovascular system by MB Munir et al.** Artif Organs 2011; 35(1): 97-8; ISSN 0160-564X.
- E. Lanzarone, A. Matta, G. Scaccabarozzi. **A patient stochastic model to support human resource planning in home care.** Prod Plan Control 2010; 21(1):3-25; ISSN 0953-7287.
- E. Lanzarone, F. Gelmini, A. Fumero, M. Carini, M.L. Costantino, R. Fumero, O. Alfieri. **Preservation of endothelium nitric oxide release during beating heart surgery with respect to continuous flow cardiopulmonary bypass.** Perfusion-UK 2010; 25(2):57-64; ISSN 0267-6591.
- E. Lanzarone, F. Gelmini, M. Tessari, T. Menon, H. Suzuki, M. Carini, M.L. Costantino, R. Fumero, G.B. Luciani, G. Faggian. **Preservation of endothelium nitric oxide release by pulsatile flow cardiopulmonary bypass when compared with continuous flow.** Artif Organs 2009; 33(11):926-34; ISSN 0160-564X.
- E. Lanzarone, R. Vismara, G.B. Fiore. **A new pulsatile volumetric device with biomorphic valves for the in vitro study of the cardiovascular system.** Artif Organs 2009; 33(12):1048-62; ISSN 0160-564X.
- G. Casagrande, E. Lanzarone, F. Miglietta, A. Remuzzi, R. Fumero, M.L. Costantino. **Determination of cardiovascular mechanics evolution in the presence of the arteriovenous fistula.** ASAIO J 2009; 55(5): 484-93; ISSN 1058-2916.
- F. Aletti, E. Lanzarone, M.L. Costantino, G. Baselli. **Simulation study of autoregulation responses of peripheral circulation to systemic pulsatility.** Nonlinear Biomed Phys 2009; 3:7; ISSN 1753-4631.
- E. Lanzarone, G. Casagrande, R. Fumero, M.L. Costantino. **Integrated model of endothelial NO regulation and systemic circulation for the comparison between pulsatile and continuous perfusion.** IEEE T Bio-Med Eng 2009; 56(5):1331-40; ISSN 0018-9294.
- E. Lanzarone, P. Liani, G. Baselli, M.L. Costantino. **Model of arterial tree and peripheral control for the study of physiological and assisted circulation.** Med Eng Phys 2007; 29(5):542-55; ISSN 1350-4533.

Chapters of international book

- E. Lanzarone, A. Matta. **The nurse-to-patient assignment problem in home care services.** In: A. Testi and E. Tànfani (eds.), *Advanced decision making methods applied to health care.* Springer 2012; 121-139; ISBN 978-88-470-2320-8.

Published proceedings of international conference

- E. Lanzarone, F. Auricchio, M. Conti, A. Ferrara. **Bayesian estimation of the aortic stiffness based on non-invasive computed tomography images.** BAYSM 2014.
- L. Martín-Fernández, E. Lanzarone. **Bayesian filtering for thermal conductivity estimation given temperature observations.** BAYSM 2014.

- E. Lanzarone, C. Masclet, F. Noël. **Collaboration enhancement through tangible metaphors: application to home care rescheduling**. Proceedings of the IEEE 4th International Conference on Cognitive Infocommunications (CogInfoCom) 2013; 387-92; ISBN 978-1-4799-1543-9.
- G. Carello, E. Lanzarone, S. Mattia. **Comparing two different objective functions in a cardinality-constrained model for the assignments in home care**. Proceedings of the 39th Conference on Operational Research Applied to Health Services (ORAHS 2013) 87-90; ISBN 978-605-64131-0-0. Abstract book; 33.
- E. Lanzarone, G. Carello, S. Mattia. **A multilevel cardinality-constrained model for the nurse-to-patient assignment problem in home care**. Proceedings of the 39th Conference on Operational Research Applied to Health Services (ORAHS 2013); 91-94; ISBN 978-605-64131-0-0. Abstract book; 33.
- I. Nawajah, R. Argiento, A. Guglielmi, E. Lanzarone. **Estimating patient demand progression in home care: a Bayesian modeling approach**. Proceedings of the 39th Conference on Operational Research Applied to Health Services (ORAHS 2013); ISBN 978-605-64131-0-0. Abstract book; 64.
- L. Martín-Fernández, G. Gilioli, E. Lanzarone, J. Míguez Arena, S. Pasquali, F. Ruggeri, D.P. Ruiz Padillo. **Joint parameter estimation and biomass tracking in a stochastic predator-prey system**. The contribution of young researchers to Bayesian statistics - Proceedings of BAYSM2013 (Springer Proceedings in Mathematics & Statistics, vol. 63); 23-27; ISBN 978-3-319-02083-9. Online paper no. 25.
- R. Argiento, A. Guglielmi, E. Lanzarone, I. Nawajah. **Bayesian analysis and prediction of patients' demands for visits in home care**. The contribution of young researchers to Bayesian statistics - Proceedings of BAYSM2013 (Springer Proceedings in Mathematics & Statistics, vol. 63); 129-133; ISBN 978-3-319-02083-9. Online paper no. 18.
- E. Lanzarone, G. Carello. **Applying the cardinality-constrained approach in health care systems: the home care example**. Proceedings of the International Conference on Health Care Systems Engineering (Springer Proceedings in Mathematics & Statistics, vol. 61); 61-72; ISBN 978-3-319-01847-8.
- E. Lanzarone, G. Carello, A. Matta. **A robust programming model for the assignment problem in home care services**. Proceedings of the 38th Conference on Operational Research Applied to Health Services (ORAHS 2012); 3c; ISBN 978-90-365-3396-6. Abstract book; 50.
- E. Lanzarone, A. Matta. **Stochastic structural policies for solving the nurse assignment problem under continuity of care in home care**. Proceedings of the 37th Conference on Operational Research Applied to Health Services (ORAHS 2011); 161-75; ISBN 978-0-9569158-0-1. Abstract book; 53.
- K. Seyed, A. Matta, E. Lanzarone, M.A. Jafari. **Application of Semi-Markov processes in modelling patient duration of stay in a home care service**. Proceedings of the 36th Conference on Operational Research Applied to Health Services (ORAHS 2010); 242-51; ISBN 978-88-568-2595-4. Abstract book; 74; ISBN 978-88-904-7205-3.
- E. Lanzarone, A. Matta, M.A. Jafari. **A simple policy for the nurse-patient assignment in home care services**. Proceedings of the IEEE Workshop on Health Care Management (WHCM 2010); ISBN 978-1-4244-4997-2.
- E. Lanzarone, A. Matta. **Value of perfect information in home care human resource planning with continuity of care**. Proceedings of the 35th Conference on Operational Research Applied to Health Services (ORAHS 2009); no. 17; ISBN 978-90-81409-90-2. Abstract book; 40.
- E. Lanzarone, A. Matta, G. Scaccabarozzi. **Workload estimation and balancing in home care organizations**. Proceedings of the 20th International Conference on Production Research 2009 (ICPR 20); 2.58; ISRC CN-E16-09-0006-0.
- F. Aletti, E. Lanzarone, M.L. Costantino, G. Baselli. **Non-linear modulation of total peripheral resistance due to pulsatility: a model study**. Computers in Cardiology 2006; 33:653-6; ISBN 978-1-4244-2532-7.

- E. Lanzarone, P. Liani, G. Baselli, M.L. Costantino. **Model of arterial tree and peripheral control for the study of physiological and assisted circulation.** Computers in Cardiology 2004; 31:85-8; ISBN 0-7803-8927-1.

Technical reports

- R. Argiento, A. Guglielmi, E. Lanzarone, I. Nawajah. **Joint prediction of health status and demand for patient in home care services: a Bayesian approach.** Technical report IMATI-CNR (Milan) 2014; 02-MI; ISSN 1722-8964. *Followed by a submitted paper.*
- G. Carello, E. Lanzarone, S. Mattia. **Advances in applying the cardinality-constrained model for the nurse-to-patient assignment problem in home care.** Technical report IASI-CNR 2013; R. 13-09; ISSN 1128-3378. *Followed by a submitted paper and a working paper.*
- L. Ironi, E. Lanzarone. **Assigning probabilities to qualitative dynamics of gene regulatory networks.** Technical report IMATI-CNR 2013; 2PV13/2/0; ISSN 1722-8964. *Followed by Ironi and Lanzarone, J Math Biol 2014, accepted for publication.*

Abstracts and other proceedings of international conference

- I. Bianchini, R. Argiento, E. Lanzarone. **Two Bayesian approaches to estimate aortic stiffness from patient-specific CTA images.** 7th International Conference of the ERCIM WG on Computational and Methodological Statistics (ERCIM 2014). Abstract book; 134.
- E. Lanzarone, G. Carello, S. Mattia. **Different perspectives and goals in home care planning.** 40th Conference on Operational Research Applied to Health Services (ORAH 2014). Conference book; 65.
- G. Casagrande, C. Bianchi, E. Lanzarone, M.L. Costantino. **Prediction of single patient response during dialysis: Bayesian estimation of patient-specific parameters and latent state variables.** 60th Annual Meeting of the American Society of Artificial Internal Organs (ASAIO 2014). Abstract book; no. 147; pag. 112.
- E. Lanzarone, C. Masclat, F. Noël. **Agility in home-care replanning through co-operation with graphical metaphors.** 5th Joint Virtual Reality Conference (JVRC 2013). Industrial session 2.
- E. Lanzarone, L. Martín-Fernández, A. Pievatolo, F. Ruggeri. **Stochastic modelling of a shredding process for PCB recycling.** Joint Meeting of Young Business and Industrial Statisticians (y-BIS 2013). Invited session. Abstract book; 55.
- A. Pievatolo, E. Lanzarone, L. Martín-Fernández, F. Ruggeri. **Design and analysis of electrospinning experiments.** Thirteenth annual conference of the European Network for Business and Industrial Statistics (ENBIS-13). Abstract book; 43.
- R. Argiento, A. Guglielmi, E. Lanzarone, I. Nawajah. **Bayesian analysis and prediction of patients' demands for visits in home health care.** Thirteenth annual conference of the European Network for Business and Industrial Statistics (ENBIS-13). Abstract book; 77.
- I. Nawajah, R. Argiento, A. Guglielmi, E. Lanzarone. **A Bayesian approach for modeling patient's demand and hidden health status: an application to home care.** Conference on Complex Data Modeling and Computationally Intensive Statistical Methods for Estimation and Prediction (S.Co.2013). Contributed poster; ISBN 97888-6493-019-0.
- L. Martín-Fernández, G. Gilioli, E. Lanzarone, J. Míguez, S. Pasquali, F. Ruggeri, D.P. Ruiz. **Functional response estimation and population tracking in a Lotka-Volterra system using a Bayesian filtering technique.** Eighth Workshop on Bayesian Inference in Stochastic Processes (BISP8). Contributed poster BISP8.33.

- I. Nawajah, A. Guglielmi, E. Lanzarone, R. Argiento. **Bayesian analysis of home health care longitudinal count data**. Eighth Workshop on Bayesian Inference in Stochastic Processes (BISP8). Contributed poster BISP8.36.
- E. Lanzarone, A. Matta. **Stochastic assignment of patients in home care services**. INFORMS Healthcare 2011. Abstract book; 28.
- E. Lanzarone, A. Matta. **Analysis of a patient-nurse assignment policy in home care services**. Actes de 5th Conférence Francophone Gestion et Ingénierie des Systèmes Hospitaliers (GISEH 2010); no. 030.
- G. Faggian, E. Lanzarone, F. Gelmini, A. Carcereri de Prati, M. Tessari, T. Menon, H. Suzuki, M. Carini, R. Fumero, G.B. Luciani, M.L. Costantino. **Endothelium NO release during cardiac surgery: comparison between continuous and pulsatile flow cardiopulmonary bypass**. Artif Organs 2009 [abstracts of the Conference]; 33(5):A75-6; ISSN 0160-564X. Proceedings of the 5th International Conference on Pediatric Mechanical Circulatory Support Systems & Pediatric Cardiopulmonary Perfusion 2009; 5:108.
- E. Lanzarone, F. Gelmini, A. Fumero, O. Alfieri, M. Tessari, T. Menon, M. Carini, H. Suzuki, G. Faggian, M.L. Costantino, R. Fumero. **Endothelial NO release and vasodilatation under continuous or pulsatile CPB: modellistic study and clinical investigation**. Int J Artif Organs 2008 [special issue on the 35th ESAO congress]; 31(7):607; ISSN 0391-3988.
- E. Lanzarone, A. Fumero, F. Gelmini, M. Orioli, M. D'Arienzo, R. Scotti, G. Aldini, F. Morazzoni, M. Carini, M.L. Costantino, R. Fumero. **Endothelium-derived nitric oxide production during cardiovascular surgery: comparison between continuous cardiopulmonary bypass and beating heart surgery**. Int J Artif Organs 2007 [special issue on the 34th ESAO congress]; 30(8):734; ISSN 0391-3988.
- F. Aletti, E. Lanzarone, M.L. Costantino, G. Baselli. **Effects of pulsatility on apparent peripheral resistance with edema**. Biomed Tech 2006 [special issue of ESGCO conference and meeting]; 51(4):A8; ISSN 0013-5585. Proceedings of ESGCO 2006; 1:264-5.
- E. Lanzarone, G. Baselli, R. Fumero, M.L. Costantino. **Model of arterial and peripheral circulation with local regulation and filtration through capillary membrane for the study of vasomotion and assisted circulation**. Int J Artif Organs 2005 [special issue on the 32th ESAO congress]; 28(9):921; ISSN 0391-3988.

National contributions

- G. Carello, E. Lanzarone, S. Mattia. **Different perspectives and goals in home care planning**. AIRO (Associazione Italiana di Ricerca Operativa) 2014 Conference, Abstracts book, 106.
- I. Nawajah, R. Argiento, A. Guglielmi, E. Lanzarone. **Joint prediction of demand and care duration in home care patients: a Bayesian approach**. SIS (Società Italiana di Statistica) 2014 Conference, Proceedings book, no. 2893; ISBN 978-88-8467-874-4.
- G. Carello, E. Lanzarone. **A robust optimization approach for the nurse-to-patient assignment problem in home care**. AIRO (Associazione Italiana di Ricerca Operativa) 2012 Conference, Abstracts book, 63.
- E. Lanzarone, A. Matta, E. Sahin, Y. Dallery. **Assigning operators to patients in home care providers**. Actes du 12e Congrès Annuel de la Société Française de Recherche Opérationnelle et d'Aide à la Décision 2011 (ROADEF 2011); Vol. II; 677-8.
- E. Lanzarone, M.L. Costantino, R. Fumero. **Endothelial nitric oxide release under pulsatile or continuous cardiopulmonary bypass: computational model**. Atti del Congresso Nazionale di Bioingegneria 2008; 187-8; Patron editore; ISBN 978-88-55529-83-9.

- E. Lanzarone, A. Fumero, H. Suzuki, F. Gelmini, M. Carini, G. Faggian, M.L. Costantino. **Endothelial nitric oxide release under pulsatile or continuous cardiopulmonary bypass or beating heart surgery: clinical investigation**. Atti del Congresso Nazionale di Bioingegneria 2008; 785-6; Pàtron editore; ISBN 978-88-55529-83-9.
- E. Lanzarone, M.L. Costantino, R. Fumero. **Il bypass cardiopolmonare e l'alterazione sistemica: il ruolo dell'endotelio**. In-Bypass 2007 [A.N.Pe.C. - Associazione Nazionale Perfusionisti in Cardiochirurgia]; 20(2):3403-10.

Didactic books

- G. Casagrande, E. Lanzarone, L. Marocco, F. Miglietta. **Esercizi di Fisica Tecnica**. Pitagora Editrice. Third ed. 2013 (first ed. 2008); ISBN 88-371-1215-7.

My theses

- E. Lanzarone. **Il ruolo attivo dell'endotelio nella risposta sistemica ad una perfusione continua o pulsatile**. Tesi di Dottorato in Bioingegneria, XX ciclo, Politecnico di Milano, 2008. Tutor: Roberto Fumero - Relatore: Maria Laura Costantino.
- E. Lanzarone, P. Liani. **Modello della circolazione arteriosa sistemica con regolazione locale dei distretti periferici**. Tesi di Laurea Quinquennale in Ingegneria Biomedica, Politecnico di Milano, 2004. Relatori: Maria Laura Costantino, Giuseppe Baselli.

Forthcoming contributions available on my web page.

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Lectures and seminars

Invited talks:

- E. Lanzarone. **Stochastic parameters estimation in dynamical systems from observations: general framework and applications**. First Joint International Meeting RSME-SCM-SEMA-SIMAI-UMI, Bilbao, Spain, July 2014. Invited talk for session Model Order Reduction and Highly Demanding Applications. Abstract book; 299.
- E. Lanzarone, S. Pasquali, V. Mussi, F. Ruggeri. **Bayesian estimation of thermal conductivity and temperature profile in homogeneous masses**. Eighth Workshop on Bayesian Inference in Stochastic Processes (BISP8). Invited young researcher (abstract BISP8.13).
- E. Lanzarone, M.L. Costantino, G. Faggian. **Continuous vs pulsatile flow in CPB: NO production and its implications**. Invited lecture at ESAO winter school 2008; Cortina d'Ampezzo (Belluno, Italy), March 2008.

Seminars:

- **Robust approaches in optimization methods for health care delivery**. Invited seminar at Yeditepe University, Industrial and Systems Engineering Department, Istanbul, Turkey, December 2, 2014.
- **Stochastic optimization methods for health care delivery: the home care example**. Invited seminar at MOX laboratory, Department of Mathematics, Politecnico di Milano, Milan, Italy, October 4, 2013.

Other presentations:

- E. Lanzarone, S. Marconi. **L'idea Beta-Lab**. Beta-Lab: Ruolo della Ricerca Traslazionale. I.R.C.C.S. Policlinico San Donato, March 11, 2014.

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Projects

Funded research projects

Coordination roles:

- **Hospital factory for manufacturing customized, patient specific 3D anatomofunctional model and prostheses – Fab@Hospital**. Flagship Project Factory of the Future – Subproject S2, funded by the Italian MIUR and CNR organizations. Principal investigator; other unit coordinators Ferdinando Auricchio (Università degli Studi di Pavia) and Giacomo Copani (CNR-ITIA). Project developed from January 2014 to December 2014.
- **Composite nanofibres for treatment of air and water by an industrial conception of electrospinning – NanoTWICE**. Flagship Project Factory of the Future – Subproject S1, funded by the Italian MIUR and CNR organizations. Coordinator of the CNR-IMATI research unit. Project developed from January 2013 to December 2014 (refunded after the first year).
- **Sviluppo di uno strumento di supporto per l'allocazione ottimale delle risorse umane in assistenza domiciliare**. Project founded by Fondazione Floriani. Referent of the project together with Andrea Matta. Project developed from March 2010 to March 2011.

Participations:

- **La Matematica per la società e l'innovazione tecnologica – MATHTECH**. Progetto Premiale 2012, funded by the Italian MIUR. Member of WP2 “Salute e Benessere” and WP5 “Fabbrica del futuro” (Leader of Task 5.3 “Modelli stocastici nella manifattura”).
- **Project Fabbrica Intelligente – FIDEAS**. Project funded by Regione Lombardia (Act 3667 of April 27, 2013) and CNR. Member of the CNR-IMATI research unit; unit coordinator Antonio Pivatolo. Project developed from April 2013.
- **Integrated technological solutions for zero waste recycling of printed circuit boards – ZeroWastePCBs**. Flagship Project Factory of the Future – Subproject S1, funded by the Italian MIUR and CNR organizations. Member of the CNR-IMATI research unit; unit coordinator Antonio Pivatolo. Project developed from January 2013 to December 2014 (refunded after the first year).
- **Flagship Project InterOmics – Subproject S1 – WP15**. Project PB.P05 funded by the Italian MIUR and CNR organizations. Member of the CNR-IMATI research unit; unit coordinator Liliana Ironi. Project developed from 2012 to 2014.
- **Sviluppo di uno strumento di supporto alla pianificazione del servizio di assistenza domiciliare**. Project founded by Fondazione Lu.V.I. Onlus. Member of the Politecnico di Milano research unit; unit coordinator Andrea Matta. Project developed from March 2008 to March 2009.

Mobility Projects:

- **Advanced visual tool for the collaborative replanning of service delivery at home: application to home health care.** Project no.138 funded by the Visionair European infrastructure. TNA referent of the project. Project developed from February 2014 to April 2014.
- **Data visualization for the complexity of human resource planning in home health care.** Project no.29 funded by the Visionair European infrastructure. TNA referent of the project. Project developed from November 2012 to July 2013.

Other results in proposed research projects

- **Robotics for rehabilitation: robotized motor coordination analysis and therapy – R4R.** Project presented to the call FIRB 2008 (code RBFR08MBEO) of the Italian MIUR organization. Coordinator of the Politecnico di Milano Research Unit. Proposal admitted to the national auditions and declared fundable, even if not funded.

Products

Commercial software with newly developed algorithms

- Developer of the optimization algorithm in TPS 3.0. www.tpssolutions.it
- Developer of the module for forecasting and assigning workload to operators contained in Hopera Oikos. www.newsysline.it
- Developer of Bee@home (human resource planner for home care service) for Bee Value Srl. This was a consultancy and technology transfer company, with an according partnership with CNR-IMATI (protocol CNR-IMATI no. 781 of April 19, 2013) for the development and the dissemination of optimization algorithms.

Didactic activity

He is Adjunct Professor and Lecturer of Mathematical Analysis, and Lecturer of Geometry and Probability and Statistics at the Politecnico di Milano.

Professor:

- *Analisi matematica 2*, Corsi di Laurea in Ingegneria Informatica e delle Telecomunicazioni (scaglione alfabetico P-Z), A.A. 2014/15.
- *Analisi matematica 2*, Corsi di Laurea in Ingegneria Informatica e delle Telecomunicazioni (scaglione alfabetico P-Z), A.A. 2013/14.
- *Analisi matematica 2*, Corsi di Laurea in Ingegneria Informatica e delle Telecomunicazioni (scaglione alfabetico P-Z), A.A. 2012/13.

Lecturer:

- *Analisi Matematica II*, Corso di Laurea in Ingegneria Matematica (Prof. Gianni Arioli), A.A. 2014/15.
- *Analisi Matematica II*, Corso di Laurea in Ingegneria Matematica (Prof. Gianni Arioli), A.A. 2013/14.
- *Analisi Matematica II*, Corso di Laurea in Ingegneria Fisica (Prof. Gianni Arioli), A.A. 2012/13.

- *Analisi e Geometria 2*, Corsi di Laurea in Ingegneria Aerospaziale, Energetica e Meccanica (Prof. Federico Giampiero Lastaria), A.A. 2012/13.
- *Analisi e Geometria 1*, Corsi di Laurea in Ingegneria Aerospaziale, Energetica e Meccanica –percorso ASPRI– (Prof. Maria Cristina Cerutti), A.A. 2012/13.
- *Analisi Matematica II*, Corso di Laurea in Ingegneria Fisica (Prof. Gianni Arioli), A.A. 2011/12.
- *Analisi Matematica II*, Corso di Laurea in Ingegneria Gestionale (Prof. Gianni Arioli), A.A. 2011/12.
- *Analisi Matematica I e Geometria*, Corso di Laurea in Ingegneria Gestionale (Prof. Roberto Notari), A.A. 2011/12.
- *Analisi e Geometria 1*, Corsi di Laurea in Ingegneria Aerospaziale, Energetica e Meccanica (Prof. Marco Ugo Claudio Boella), A.A. 2011/12.
- *Analisi Matematica II*, Corso di Laurea in Ingegneria Fisica (Prof. Gianni Arioli), A.A. 2010/11.
- *Probabilità e Statistica Matematica*, Corso di Laurea in Ingegneria Gestionale (Prof. Marco Ugo Claudio Boella), A.A. 2010/11.
- *Analisi Matematica I e Geometria*, Corso di Laurea in Ingegneria Gestionale (Prof. Marco Ugo Claudio Boella), A.A. 2010/11.
- *Probabilità e Statistica Matematica*, Corso di Laurea in Ingegneria Gestionale (Prof. Marco Ugo Claudio Boella), A.A. 2009/10.
- *Complementi di Analisi Matematica*, Corso di Laurea Magistrale in Ingegneria Chimica (Prof. Gianni Arioli), A.A. 2009/10.
- *Probabilità e Statistica Matematica*, Corso di Laurea in Ingegneria Gestionale (Prof. Marco Ugo Claudio Boella), A.A. 2008/09.
- *Complementi di Analisi Matematica*, Corso di Laurea Magistrale in Ingegneria Chimica (Prof. Gianni Arioli), A.A. 2008/09.

Previously, he was also Adjunct Professor and Lecturer of Thermodynamics and Heat Transfer at the Politecnico di Milano:

Professor:

- *Fisica Tecnica*, Corso di Laurea in Ingegneria Civile e Ambientale, Polo Regionale di Lecco, A.A. 2009/10.

Lecturer:

- *Fisica Tecnica e Sistemi Energetici (modulo di Fisica Tecnica)*, Corso di Laurea in Ingegneria Gestionale (Prof. Antonio Salerno), A.A. 2011/12.
- *Fisica Tecnica e Sistemi Energetici (modulo di Fisica Tecnica)*, Corso di Laurea in Ingegneria Gestionale (Prof. Alberto Salioni), A.A. 2011/12.
- *Fisica Tecnica*, Corso di Laurea in Ingegneria Aerospaziale (Prof. Ferruccio Miglietta), A.A. 2010/11.
- *Fisica Tecnica*, Corso di Laurea in Ingegneria Civile e Ambientale (Prof. Fabio Inzoli), Polo Regionale di Lecco, A.A. 2010/11.
- *Fisica Tecnica*, Corso di Laurea in Ingegneria Civile e Ambientale (Prof. Fabio Inzoli), Polo Regionale di Como, A.A. 2010/11.
- *Fisica Tecnica e Sistemi Energetici (modulo di Fisica Tecnica)*, Corso di Laurea in Ingegneria Gestionale (Prof. Alberto Salioni), A.A. 2010/11.

- *Fisica Tecnica*, Corso di Laurea in Ingegneria Aerospaziale (Prof. Ferruccio Miglietta), A.A. 2009/10.
- *Fisica Tecnica*, Corso di Laurea in Ingegneria Aerospaziale (Prof. Ferruccio Miglietta), A.A. 2008/09.
- *Fisica Tecnica*, Corso di Laurea in Ingegneria Meccanica (Prof. Ferruccio Miglietta), A.A. 2006/07.
- *Fisica Tecnica*, Corso di Laurea in Ingegneria Meccanica (Prof. Ferruccio Miglietta), A.A. 2005/06.
- *Fisica Tecnica*, Corso di Laurea in Ingegneria Meccanica (Prof. Ferruccio Miglietta), A.A. 2004/05.

Moreover, he also performed other didactic activities at the Politecnico di Milano:

- Project reviewer for the course *Research management* (Ph.D. school, Prof. Tullio Tolio e Marcello Urgo), A.A. 2010/11, 2012/13, and 2013/14.
- Lecturer of *Sistemi integrati di produzione*, Corso di Laurea Magistrale in Ingegneria Meccanica (Prof. Andrea Matta), A.A. 2010/11.
- Seminars for various courses within the Industrial Bioengineering.
- Various tutoring activities.

He is *cultore della materia* of Applied Physics at the Degree Course in Nursing, School of Medicine and Surgery, Università degli Studi di Milano.

He has been co-relator of some Master Degree Theses and Bachelor Degree Theses. List of Master Degree Theses:

- L. Pagani. **Progettazione, implementazione e validazione sperimentale di un software di controllo retroazionato per una pompa pulsatile da banco.** Tesi di Laurea Magistrale in Ingegneria Biomedica, Politecnico di Milano, 2008. Relatore: M.L. Costantino. Correlatori: E. Lanzarone, E. Cutrì.
- F. Barbone, G. Intini. **Modello del controllo endoteliale della circolazione arteriosa in perfusione continua o pulsatile.** Tesi di Laurea Magistrale in Ingegneria Biomedica, Politecnico di Milano, 2007. Relatore: M.L. Costantino. Correlatore: E. Lanzarone.
- F. Aletti. **Risposta dei distretti periferici alle condizioni di circolazione in un modello di albero arterioso.** Tesi di Laurea Quinquennale in Ingegneria Biomedica, Politecnico di Milano, 2005. Relatori: G. Baselli, M.L. Costantino. Correlatore: E. Lanzarone.

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Editorial committees

Journals

- **Journal of Statistical Data Analysis & Operations Research.**
Member of the editorial board.

Books

- E. Lanzarone, F. Ieva (eds.) **The contribution of young researchers to Bayesian statistics - Proceedings of BAYSM2013.** Springer Proceedings in Mathematics & Statistics; vol. 63 (2014); ISBN 978-3-319-02083-9.

- A. Matta, E. Sahin, J. Li, E. Lanzarone, J. Fowler (eds.) **Proceedings of the International Conference on Health Care Systems Engineering**. Springer Proceedings in Mathematics & Statistics; vol. 61 (2014); ISBN 978-3-319-01847-8.

Conference
roles

Conference committees

- *Third Bayesian young statisticians meeting (BAYSM 2016)*. Florence, Italy, June 19-21, 2016. Conference chair with R. Argiento.
www.mi.imati.cnr.it/conferences/BAYSM2016
- *Eighth Workshop on Bayesian Inference in stochastic processes (BISP8)*. Milan, Italy, June 6-8, 2013. Member of the organising committee.
www.mi.imati.cnr.it/conferences/BISP8
- *First Bayesian young statisticians meeting (BAYSM 2013)*. Milan, Italy, June 5-6, 2013. Conference chair with F. Ieva.
www.mi.imati.cnr.it/conferences/BAYSM2013
- *International Conference on Health Care Systems Engineering (HCSE 2013)*. Milan, Italy, May 22-24, 2013. Member of the scientific and of the organising committees.
hcse2013.mecc.polimi.it

Conference boards

- *Bayesian young statisticians meeting (BAYSM)*. Member of the BAYSM board.
www.mi.imati.cnr.it/ettore/BAYSM

Session chair

- *39th Conference on Operational Research Applied to Health Services (ORAHS 2009)*. Istanbul, Turkey, July 7-12, 2013. Chair of the session “OR methodologies for home care”.
- *35th Conference on Operational Research Applied to Health Services (ORAHS 2009)*. Leuven, Belgium, July 12-17, 2009. Chair of the session “Home care services”.

Fellowships

Scientific responsible of the following “Assegni di Ricerca”

- Dr. Fabio Manganini (March 2014 – March 2015)
Modelli stocastici per l’ottimizzazione del processo di elettrofilatura e sull’analisi delle immagini SEM di manufatti ottenuti tramite elettrofilatura.
- Dr. Laura Martín-Fernández (April 2013 – September 2013)
Modellazione stocastica dei processi industriali: frantumazione di schede elettroniche e separazione dei materiali che le compongono; deposizione di nanofibre a base polimerica su matrice tramite elettrofilatura (jointly with A. Pievatolo).

Scientific responsible of the following “Borse di Studio”

- Dr. Annalisa Romantini (June 2014)
Modelli matematici differenziali e stocastici a supporto dello studio dell'emodinamica vascolare in vitro.
- Dr. Ilaria Bianchini (May 2014 - October 2014)
Metodologie parametriche e non parametriche di statistica bayesiana applicate allo studio della biomeccanica.

Scientific responsible of the following “Contratti di Collaborazione”

- Dr. Anna Ferrara (October 2014 - January 2015)
Modelli matematici e strutturali a supporto dello studio dell'emodinamica vascolare in vitro.

Co-advisor of the following Ph.D. Theses

- Dr. Seda Baş, *working PhD project.*
Ph.D. Thesis in Industrial and System Engineering, Yeditepe University, Istanbul, Turkey. Advisor: Z. Ocak; Co-advisor: E. Lanzarone.
- Dr. Inad Nawajah, *Bayesian analysis of home care longitudinal counts data.*
Ph.D. Thesis in Mathematical Models and Methods in Engineering, Politecnico di Milano, Milan, Italy, 2014. Advisor: A. Guglielmi; Co-advisors: R. Argiento, E. Lanzarone.

Academic committees

He participated to:

- *Ph.D. dissertation, Departamento de Física Aplicada, Universidad de Granada, Spain*
Invited member of the committee, November 21, 2012
fisicaaplicada.ugr.es

Visiting periods

He has been visiting researcher at:

- **Yeditepe University, Industrial and Systems Engineering Department**, Istanbul, Turkey. Visiting researcher for a PhD Research Project, November 2014.
sy.yeditepe.edu.tr
- **HEC, Département des sciences de la décision**, Montréal, Canada. Visiting researcher invited and hosted by Prof. Soriano, maggio 2014. www.hec.ca
- **Labotatoire des sciences pour la conception, l’optimisation et la production (G-SCOP)**, CNRS-INPG-UJF, Grenoble, France. Visiting researcher for the Visionair Project no.138, April 2014. www.g-scop.grenoble-inp.fr
- **King Abdullah University of Science and Technology (KAUST)**, Thuwal, Saudi Arabia. Visiting researcher invited and hosted at the Center for Uncertainty Quantification in Computational Science & Engineering, April 2013. sri-uq.kaust.edu.sa
- **Labotatoire des sciences pour la conception, l’optimisation et la production (G-SCOP)**, CNRS-INPG-UJF, Grenoble, France. Visiting researcher for the Visionair Project no.29, November 2012 and July 2013. www.g-scop.grenoble-inp.fr

Reviewer activity

Reviewer for:

- Referee for the evaluation of research projects on behalf of the Italian Ministry of Education, University and Research.
- Referee for the evaluation of research projects for the Visionair European infrastructure.
- Referee for international journals (Artificial Organs; Cardiovascular Diabetology; Decision Sciences; Flexible Services and Manufacturing Journal; IEEE Transactions on Biomedical Engineering; IEEE Transactions on Systems, Man, and Cybernetics; International Journal of Planning and Scheduling; International Journal of Production Research; Journal of Biomechanics; Transportation Research Part E: Logistics and Transportation Review)

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Engineering profession

He is member of the Ordine degli Ingegneri della Provincia di Milano (Section A – Registration number 27094 a,b,c).

www.ordineingegneri.milano.it

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Awards

He received:

- Italian National Bioengineering Group (GNB) award for Master Degree Thesis XXIII Annual School of Bioengineering, Brixen, September 2004
www.bioing.it

updated January 20, 2015

