

## DAVIDE MANCA

PSE-Lab, Process System Engineering Laboratory  
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### Education

- 1994-1995 Post Doc grant from Fondazione Lombardia per l'Ambiente  
Research topic: Technologies for the combustion improvement and reduction of toxic compounds
- 1991-1994 Ph.D. in Chemical Engineering at Politecnico di Milano  
Thesis: Optimization and Control of Multiple Crude Oil Distillation Units
- 1991 Chemical Engineering qualifying examination, 100/100 at Politecnico di Milano
- 1984-1990 M.Sc. in Chemical Engineering, 100/100 cum laude at Politecnico di Milano  
Thesis: Design of a MIMO control system for distillation columns: linear and non-linear approach

### Academic career

- 2002- Associate professor in Process Systems Engineering  
Politecnico di Milano
- 1995-2002 Assistant professor in Process Systems Engineering  
Politecnico di Milano

### Academic courses

- 1998-1999 Applied Mathematics (numerical calculus)  
Faculty of Architecture – Politecnico di Milano
- 1999-2002 Conceptual Design of Chemical Processes  
Master Degree in Chemical Engineering – Politecnico di Milano
- 2003- Applied Numerical Calculus  
Bachelor Degree in Chemical Engineering – Politecnico di Milano
- 2003-2012 Process Design and Economics  
Master Degree in Chemical Engineering – Politecnico di Milano
- 2004-2007 Safety assessment for the city and the territory  
Faculty of Architecture – Politecnico di Milano
- 2005- Advanced methods for process design and optimization (in English)  
Ph.D. school of Chemical Engineering – Politecnico di Milano
- 2007-2011 + Dynamics and Control of Chemical Processes
- 2017- Master Degree in Chemical Engineering – Politecnico di Milano
- 2009- Instrumentation and Control of Chemical Plants  
Master Degree in Chemical Engineering – Politecnico di Milano
- 2012- Process Systems Engineering (in English)  
Master Degree in Chemical Engineering – Politecnico di Milano

### Supervisor

- 32 Bachelor degree theses in Chemical Engineering
- 55 Master degree theses in Chemical Engineering

- 5 Ph.D. theses in Chemical Engineering
- 3 Post-doc positions

#### **National research collaborations (other than Politecnico di Milano)**

- Prof. M. Barolo, Università di Padova, “Batch distillation and optimal control trajectories”
- Prof. A. Barresi, G. Baldi, D. Fissore, Politecnico di Torino, “Simulated moving bed reactors. Modeling and Optimization”
- Prof. R. Baratti, Università di Cagliari, “Artificial Neural Networks for system identification”
- Prof. C. Scali, Università di Pisa, “Model based control in process industries”
- Prof. A. Servida, Università di Genova, “System identification”
- Prof. S. Crescitelli, Università di Napoli, “Non-linear process dynamics”
- Proff. G. Continillo, E. Mancusi, Università del Sannio, “Non-linear process dynamics”
- Prof. M. Grassi, Università di Trieste, “First principles modeling of pharmaceutical processes”
- Prof. V. Cozzani, Università di Bologna, “Safety assessment in chemical processes”
- Prof. F. Bezzo, Università di Padova, “Strategic design for the supply-chain optimization”
- Prof. G. Lamberti, Università di Salerno, “Pharmacokinetics and pharmacodynamics”
- Prof. M. Grassi, Università di Trieste, “Pharmacokinetics and microencapsulation”
- Prof. G. Cavallaro, Università di Palermo, “Special polymers for controlled release of anticancer drugs”

#### **International research collaborations**

- Prof. J.A. Fay – MIT, USA, “Pool spreading and evaporation”
- PhD. S. Hanna – Hanna Consulting, USA, “Pool spreading and evaporation”
- Prof. D.M Webber – HSE, UK, “Pool spreading and evaporation”
- Prof. P.W.M. Brighton – HSE, UK, “Pool spreading and evaporation”
- PhDs M. Brown, Reisner, Chang – LANL, “Dispersion of heavy and buoyant gases in complex industrial environments”
- Prof. P. A. Webley, Monash University – Australia, “Numerical solution of stiff ODE systems”
- Prof. U. Diwekar – Vishwamitra Research Institute – USA, “Multiobjective optimization of fuel-cell systems for trucks”
- Prof. V. Plesu – Bucarest, Romania – Reviewer of the Ph.D. thesis of Petrica Iancu “Process integration for water minimization in oil processing and petrochemistry”
- Prof. R. Aguilar-López – Special issue of Chemical Product and Process Engineering “Process modeling and Control”, Departamento de Biotecnología y Bioingeniería, CINVESTAV-IPN – Mexico
- Prof. I. Mujtaba – Bradford University, UK – Research activity on Water Desalination Systems
- Prof. IL Moon – Yonsei University, Korea – Price forecast of commodities and utilities
- Prof. Fengqi You – Northwestern University, USA – Supply chain management
- Prof. Annette Kluge – Duisburg University, Germany – Human factors in industrial operators training
- Prof. Kjell Ivar Øvergård – Vestfold University College, Norway – Situation awareness of operators in the maritime sector
- Prof. A. Espuna – Escola Tècnica Superior d’Enginyeria Industrial de Barcelona, Spain – Econometric models for scheduling and planning problems of chemical processes
- Prof. Jessie Au, Chief Scientific Officer, Optimum Therapeutics LLC, and Distinguished University Professor Emeritus, The Ohio State University – Quantitative Systems Pharmacology
- Prof. Tiina Kumulainen – Oslo and Akershus University College, Norway – Advanced Training Methods for Industrial Operators
- Prof. Salman Nazir – Buskerud and Vestfold University College, Tønsberg, Norway – Advanced Training Methods for Maritime Operators

- Prof. Edwin Zondervan – Bremen University, Germany – Process Systems Engineering

#### **Academic appointments**

- Member of the department executive board
- Member of the department external relations commission
- Member of the interdisciplinary and inter-departmental research center for Combustion
- Member of the department informatics commission
- Member of the department publications commission
- Member of the department commission for spin-off projects
- Member of the joint committee of the Engineering School at Politecnico di Milano
- Member of three national commissions for assistant professor positions
- Member of four national commissions for the PhD final defense
- Member of five commissions for post-doc positions at Politecnico di Milano
- Member of the Joint Committee (Commissione Paritetica) of the Engineering School of Industrial Processes at Politecnico di Milano
- Head of PSE-Lab the “Process Systems Engineering” laboratory at Politecnico di Milano
- Executive member and Treasurer of EURECHA (The European Committee for Use of Computers in Chemical Engineering Education)

#### **PhD schools and Continuing education courses**

- Founder of the national and triennial PhD school in Process Systems Engineering, “1. Process Dynamics”, “2. Process Control”, “3. Process Reconciliation and Optimization”, (2001–2009)
- Director of the continuing education school “Advanced control, optimization and supervision of chemical processes”, Politecnico di Milano
- Director of the continuing education school “Design and Control of Incineration plants”, Politecnico di Milano
- Director of the continuing education school “Artificial Neural Networks, Fuzzy Logic, Genetic Algorithms”, Politecnico di Milano
- Academic staff of the continuing education school “Advanced process control”, ENI group
- Academic staff of the PhD School “Numerical methods for chemical engineering”, University of Bologna
- Academic staff of the continuing education school “Heating systems: quality of the air and of the environment”, AIRU association
- Academic staff of the Master in “Design of off-shore platforms. How to model the safety”, University of Bologna
- Academic staff of the continuing education school “Process Analytical Technologies: applications to the pharmaceutical industry”, DISTEF Project, MIUR Grant (DM 28539) “Nanotechnologies for the Industrial Packaging”, Bologna, 2008
- Academic staff of the qualification course “Heat and mass transfer”, SILSIS school, (2003–2009)
- Academic staff of the advanced qualification course “Planning in areas with integrated risk”, Italian Ministry for the Environment, 2011

#### **National research grants**

- Member of the Italian Research Project (PRIN-MIUR ex MURST) “Numerical modeling of combustion processes” for POLIMI Research Unit, (1996-1998)
- Person in charge for POLIMI of the Italian Research Project (PRIN-MIUR ex MURST) “Dynamics, Control, and Optimization of Chemical Processes”, (1998-2000)

- Person in charge for POLIMI of the Italian Research Project, (PRIN-MIUR ex MURST) “Multivariable control systems for forced networks of unsteady reactors”, (2002-2004)
- Member of the Italian Research Project (FIRB-MIUR) “Conceptual design of a new natural-fiber process” for the POLIMI Research Unit, (2007-2011)
- Member of the Italian Research Project (PRIN-MIUR) “Performance indicators in the process design” for the POLIMI Research Unit, (2008-2010)
- Person in charge for POLIMI of the Italian Research Project (PRIN-MIUR-2010) “Identification of optimal delivery systems for the Nucleic Acid Based Drugs and study of the action mechanisms in some models of human tumoral and inflammatory pathologies, (36 months, 2013-2016)

#### **Funded Research projects with private industries**

- Research member of the industrial contract with CISE (ENI), “Steady-state simulation of water treatment units”, (1997-2009)
- Research member of the industrial contract with Enea Casaccia “Steady-state simulation of fuel-cell systems”, (1999-2002)
- Person in charge of the industrial contract with Eurand S.p.A. “Microencapsulation of drugs and Controlled Release”, (2000-2001)
- Person in charge of the industrial contract with Eurand S.p.A. “Interfacial phenomena in the deposition of polymers on active principle granules”, (2002-2003)
- Person in charge of the industrial contract with Eurand S.p.A. “High energy mechanochemical activation”, (2003-2005)
- Person in charge of the industrial contract with Pietro Fiorentini S.p.A. “Design and simulation of a centrifuge multiphase separator for the treatment of crude oils”, (2005-2006)
- Research member of the industrial contract with Transplan S.r.l. “Design of a rescue vehicle for hazardous industrial environments”, (2007)
- Person in charge of the industrial contract with Termokimik Corporation “Steady-state simulation of the CO<sub>2</sub> absorption with amines”, (2007)
- Person in charge of the industrial contract with IMA S.p.A. “Introduction of the Process Analytical Technologies in the solid-dose production line”, (2007-2008)
- Person in charge of the industrial contract with IMA S.p.A. “Optimization of batch and continuous granulation and exsiccation processes”, (2008-2009)
- Co-Person in charge (with prof. S. Pierucci) of the industrial contract with Altran Italia S.p.A. “Value proposition of DCS product lines”, (2010-2011)
- Person in charge of the industrial contract with ABB Italia S.p.A. “Modeling of the microwave characterization of the unburnt C fraction in exhaust streams from coal-dust power plants”, (2011-2012)
- Person in charge of the industrial contract with CIM Progetti S.p.A., “Conceptual design of a pilot scale reactor for calcium hydroxide by sonochemical activation”, (2012-2013)
- Person in charge of the industrial contract with APT Services S.r.l., “Design of experiments for fire-prevention systems in railway tunnels”, (2013-2015)

#### **Funded Research projects with National or European Community public bodies**

- Person in charge of the public contract “Safety in the municipality”, Lombardia Region, (2002-2004)
- Person in charge for the CMIC Department of the public contract “Quater – Quality of the territory”, European Community, (2003-2004)
- Research member for the public contract “Emergency preparedness and emergency response. Procedures for the mitigation of natural and anthropic risks”, European Community, (2004-2005)

- Research member for the public contract “Municipal emergency plan in case of industrial accident”, Lainate municipality, (2004-2005)
- Person in charge for POLIMI of the public contract “PRE-EMERGENCIES: emergency preparedness for civil protection to sudden and mounting risks”, European Community – DG Environment, (2006-2007)
- Person in charge of the working group on “Simulation of industrial accidents. Pools fires, explosions, dispersion of toxic compounds”, VIRTUALIS Project, European Community – DG Research, (2006-2010)
- Research member for the inter-departmental project “An integrated approach to risk assessment in industrial areas”, Politecnico di Milano, (2006-2009)
- Research member for the inter-departmental project “Knowledge structure for the support of preventive actions”, Politecnico di Milano, (2006-2009)

### **Invited Lectures**

- “Mathematics”, Lombardia Region undergraduate course, 1996
- “Advanced control of incineration processes”, CRIS specialization course, 1998
- “Dynamics, Control, and Supervision of Chemical Processes”, ENI, 1998
- “Micropollutants formation in combustion processes”, postgraduate course, 1999
- “System identification: ARX, ARMAX, NARX, ANN”, PhD course, 2001
- “Model Based Control of Heterogeneous Combustion Processes”, PhD course, 2001
- “Fluid Mechanics”, undergraduate course, 2002
- “Chemical and Industrial Risk analysis”, ASERI Master course, 2002 and 2003
- “Technological disasters: industrial and transport accidents”, IREF Master course, 2004
- “Multivariable control. Thermographic analysis of the combustion chamber in an incineration plant”, ANIPLA, 2005 and 2006
- “Civil protection: advanced systems for the emergency response”, Palazzo Turati, 2006
- “PAT – Process Analytical Technologies for pharmaceutical processes”, IMA, 2006
- “Dispersion models for heavy and buoyant gases”, POLIMI postgraduate course, 2006-2011
- “Emergency planning for chemical and industrial risk”, IREF postgraduate course, 2006
- “Chemical and industrial risk”, IREF postgraduate course, 2006
- “Emergency preparedness and Risk analysis”, ILAS, 2007
- “Hierarchical improvement of the safety in road tunnels”, Italian Civil Protection Agency, Varenna, 2008
- “Data Reconciliation and Soft Sensors in continuous and batch processes”, Chemprod Workshop, Milan, September 4, 2008
- “Inferential measures and soft sensors for dynamic tracking of process variables”, Workshop “PAT solutions for the efficiency and quality improvement in the pharmaceutical industries”, Siemens, Milan, October 6, 2009
- “Dynamic Simulation of accident events in industrial plants for the training of control room and field operators”, Workshop “Operator Training Simulator and Dynamic Simulation”, ENI, Milan, November 10, 2009
- “Model-based innovation in the process industry”, Workshop DIPIC, Padua, 2010
- “Dynamic simulation of accident events in industrial plants: the BP Texas Refinery case study”, Workshop on Dynamic Simulation of Industrial Plants”, ENI, Milan, October 26, 2010
- “Inferential measures and soft sensors for dynamic tracking of process variables”, workshop on “Industrial Applications of EUDRAGIT”, IMA, Bologna, October 13, 2011
- “Virtual and Augmented Reality: tools to increase the process understanding of field operators”, Workshop “3D Simulation”, ENI, Milan, October 18, 2011

- “Event reconstruction of Viareggio accident event by means of detailed numerical simulation”, Workshop “Innovative aspects in the field of relevant accident risks”, University of Insubria, Varese, 14 November, 2011
- “The Viareggio railway accident: lessons-learned”, International symposium “Integrated Risk Definition, Assessment, Management”, Milan, March 14-16, 2012
- “The Viareggio railway accident: Lessons-learnt”, AIAS Conference, Milan, May 18, 2012
- “3D virtual immersive environments for industrial operator training”, Duisburg, Germany, October 23-24, 2013
- “The Viareggio railway accident: Lessons-learned”, ESA-AIAS Conference, Milan, November 14, 2013
- “A Methodology for the Automated Assessment of Operators’ Performance”, Workshop on Training and Assessment– Buskerud and Vestfold University College, Norway, May 6, 2015
- “A PSE approach to patient-individualized physiologically based pharmacokinetic modeling”, Keynote Lecture at ESCAPE-25 and PSE 2015 on in Copenhagen, Denmark, May 31 - June 4, 2015
- “Similarities between human body and chemical plants in modeling of physiologically-based pharmacokinetics”, McCormic Northwestern University, Chemical and Biological Engineering Department, Evanston, Chicago (USA), August 27, 2015
- “Apprendere dalla ricostruzione degli incidenti industriali per migliorare la sicurezza di processo”, Congress on “La sicurezza nell'industria di processo e la riduzione dei rischi al valore ALARP (As Low As Reasonably Possible)”, Milan, September 25, 2015
- “Dati, cifre, numeri, quantità, grandezze, percentuali, andamenti e fenomeni: gli errori da non commettere nella formulazione di una notizia”, Conference given to the Order of Italian Journalists, Milan, November 20, 2015
- “Training Simulators for Extreme Environments”, Third Workshop on Training and Assessment, University College of Southeast Norway, Research Park, Campus Vestfold, Norway, May 4, 2016

#### **Academic awards**

- 4 awards for the “Best chemical engineering thesis” at POLIMI in: 1996, 2001, 2003, 2005
- Second position in the international contest “Excellence in Simulation. University Grant Program Simsci-Esscor (Invensys Process Systems). Lake Forest, CA, USA”, with the manuscript “Advances in Plant-Wide Design and Control by Process Dynamic Simulation”, F. Manenti, D. Manca, 2007
- Supervisor of the PhD thesis award, third placing, to Roberto Andrea Abbiati, CIIC PhD Committee, Politecnico di Milano, 2017

#### **Industrial awards**

- Four grants as best undergraduate, graduate and post-doc student, (1986-1993)
- Winner of the Honeywell User Group prize for the best research memory, Barcelona, 2010
- Winner of the best 2009 paper prize by the Italian National Association for the Automation (ANIPLA), 2010

#### **Chairman at International Conferences**

- “First European Congress on Chemical and Process Engineering, ECCE 1”, Firenze, Italy, May 4-7 (1997)
- “The Fourth Italian Conference on Chemical and Process Engineering, ICheaP-4”, Florence, 2-5 May, (1999)
- “The Fifth Italian Conference on Chemical and Process Engineering, ICheaP-5”, Florence, 20-23 May, (2001)
- “ICheaP-7 Chemical and Process Engineering”, Taormina, 15-18 May, (2005)

- “Major Risks Challenging Publics, Scientists and Governments”, Society for Risk Analysis, Como 12-14 September, (2005)
- “CISAP-2: Second International Conference on Safety & Environment in Process Industry, Napoli, Italy, (2006)
- “ESCAPE-17 European Symposium on Computers and Process Engineering”, Bucharest, Romania, (2007)
- “CISAP-3: Second International Conference on Safety & Environment in Process Industry”, Rome, Italy, (2008)
- “PSAM-9 International Conference on Probabilistic Safety Assessment and Management”, Hong Kong (2008)
- “ICheaP-9: The ninth International Conference on Chemical & Process Engineering”, Rome, Italy, (2009)
- “CISAP-4: 4th International Conference on Safety & Environment in Process Industry”, Florence, Italy, (2010)
- “ESCAPE-20 European Symposium on Computer Aided Process Engineering”, Ischia, Italy, (2010)
- “ESCAPE-21 European Symposium on Computer Aided Process Engineering”, Porto Carras, Greece, Italy, (2011)
- “CISAP-5: 5th International Conference on Safety & Environment in Process Industry”, Milan, Italy, (2012)
- “PSE-2012: 11th International Symposium on Process Systems Engineering” Singapore, (2012)
- “ICheaP-11 International Conference on Chemical & Process Engineering” Milan, Italy, (2013)
- “ESCAPE-23 European Symposium on Computer Aided Process Engineering”, Lappeenranta, Finland, (2013)
- “CISAP-6: 6th International Conference on Safety & Environment in Process Industry”, Bologna, Italy, (2014)
- “ESCAPE-26 European Symposium on Computer Aided Process Engineering”, Portoroz, Slovenia, (2016)
- “CISAP-7: 7th International Conference on Safety & Environment in Process Industry”, Ischia, Italy, (2016)

#### **Member of the scientific committee at international conferences**

- “DINIP 2002: Nonlinear Dynamics and Control in Process Engineering”, Benevento, 11-13 April, (2002)
- “Major Risks Challenging Publics, Scientists and Governments”, Society for Risk Analysis, (2004-2005)
- “PSAM-9: Ninth International Probabilistic safety Assessment and Management Conference”, International Association PSAM, Hong-Kong (China), (2007-2008)
- “WCCE8: 8th World Congress of Chemical Engineering”, Montreal, Canada, (2009)
- “CISAP-4: Fourth International Conference on Safety & Environment in Process Industry, Florence, Italy, (2010)
- “ESCAPE-20: European Symposium on Computers and Process Engineering”, Ischia, Italy, (2010)
- “ICheaP-10: 10<sup>th</sup> International Conference on Chemical & Process Engineering”, Florence, Italy, (2011)
- “CISAP-5: Fifth International Conference on Safety & Environment in Process Industry, Milan, Italy, (2012)
- “PSE-2012: 11<sup>th</sup> International Symposium on Process Systems Engineering” Singapore, (2012)
- “ESCAPE-23: European Symposium on Computer Aided Process Engineering” Lappeenranta, Finland, (2013)
- “ICheaP-11: 11<sup>th</sup> International Conference on Chemical & Process Engineering”, Milan, Italy, (2013)
- “CISAP-6: Sixth International Conference on Safety & Environment in Process Industry, Bologna, Italy, (2014)
- “ESCAPE-24 Working party – European Symposium on Computer Aided Process Engineering”, Budapest, Hungary, (2014)
- “ICheaP-12: 12<sup>th</sup> International Conference on Chemical & Process Engineering”, Milan, Italy, (2015)
- “ESCAPE-26 European Symposium on Computer Aided Process Engineering”, Portorož, Slovenia, (2016)

- **CHAIRPERSON** of “CISAP-7: Seventh International Conference on Safety & Environment in Process Industry, Bologna, Italy, (2016)
- “ESCAPE-27 European Symposium on Computer Aided Process Engineering”, Barcelona, Spain, (2017)

#### **Reviewer of International Journals and Scientific Books**

- Arabian Journal for Science and Engineering
- Bioresource Technology
- Chemical and Biological Engineering Quarterly
- Chemical Engineering Research and Design
- Chemical Engineering Science
- Chemical Product and Process Modeling
- Chemistry Today
- Combustion and Flames
- Computers & Chemical Engineering
- CRC Press – Taylor & Francis Group
- Drying Technology
- Environment & Planning C: Government & Policy
- Environmental Engineering Science
- IEEE Computer Graphics and Applications
- Industrial & Engineering Chemistry Research
- International Journal of Computer Systems Science and Engineering
- International Journal of Disaster Risk Reduction
- International Journal of Thermal Sciences
- International Journal of Zhejiang University SCIENCE (A&B)
- Journal of Drug Delivery Science and Technology
- Journal of Food Engineering
- Journal of Hazardous Materials
- Journal of Loss Prevention in the Process Industries
- Journal of Pharmaceutical Sciences
- Journal of Power and Energy
- Journal of Process Control
- Numerical Heat Transfer
- Pharmaceutical Engineering
- Processes
- Progress in Colloid and Polymer Science
- Quantitative Finance
- The Canadian Journal of Chemical Engineering

#### **Reviewer of national research projects**

- Peer reviewer of three applications to the Italian Flagship Project “La Fabbrica del Futuro”, 2012
- Peer reviewer of two applications to the Italian Flagship Project “La Fabbrica del Futuro”, 2013
- Reviewer of a MIUR/PRIN application for an Italian inter-university research project, 2012

#### **Associate Editor of International Journals and Book series**

- Chemical Product and Process Modeling, 12/2007-
- The Scientific World Journal, 06/2012-



- Editor of the Elsevier Book Series on Computer Aided Chemical Engineering with the book: “Quantitative Systems Pharmacology: Models and Model-based Systems with Applications”, 2016-2017
- Guest editor of the Chemical Engineering Transactions, AIDIC, volume 53, 2016
- Member of the editorial board of “Frontiers in Chemistry”, 9/2016-

#### **Public advice**

- Province of Lucca, Italy, “Technical advice for the criminal trial of the Viareggio Jun-2009 LPG railway accident”, 2012
- Public advice and participation to the decision-making process, meeting with the citizenhood “Design of a coastal LPG storage system at the industrial harbor of Ortona”, Ortona, Italy, 8 June 2016
- Expert member for Valle d’Aosta Region for the public assessment of development plans and research projects, June 2016-

#### **Industrial advice**

- Vampa Combustion, “Design and simulation of incineration plants”, 1990
- Sipsa Ecologica, “Design and simulation of incineration plants”, 1991
- SNIA Engineering, “Design of H<sub>2</sub>S removal by Claus process”, 1991
- Snamprogetti, “Design and simulation of incineration plants”, 1992
- KTI, “Design and simulation of incineration plants”, 1993
- Ambiente, “Optimization of incineration processes”, 1994
- Eniricerche, “Optimization of energy-intensive processes”, 1995
- Snamprogetti, “Optimization of incineration processes”, 1996
- ECO Center, “On-line measurement and monitoring of micropollutants from incineration processes”, 1998-2005
- Orsi automation, “Advanced control and optimization of incineration processes”, 1999
- AGAC, “Advanced control and optimization of incineration processes”, 2001
- Samil Defence, “Security devices for military applications”, 2002-2004
- ABB, “Advanced control and optimization of incineration processes”, 2003
- Esplodenti Sabino, “Safety plans for industrial processes that handle explosive materials”, 2010-2015
- PF EUROCOM, “Simulation program of an incineration plant for off-line training of operators”, 2012-2013
- COIM, “The role of precursors for the production of drugs”, 2013
- HeTech-Marpos, “Legal advice in a prosecution of Helium pressurized testing equipment”, 2014-2015
- Esplodenti Sabino, “Conceptual design of an ultrasonic granulator for explosive substances”, 2015

#### **Participation and founding of spin-off companies**

- Promoting partner of Virthualis Srl an engineering and research company focused on improving decision-making in the design and implementation of industrial safety. Virthualis Srl is the natural spin-off of the five-year EC VI FP DG Research project.
- RTD and ENG Director of Virthualis Srl company, 2010-2014.

#### **Current research activity and interests**

- Scheduling, planning and supply chain of chemical and industrial processes
- PAT – Process Analytical Technologies for pharmaceutical processes
- Lime hydration: process understanding, conceptual design and advanced control
- Industrial accident simulation: liquid and gas emissions, pool spreading on ground and water, pool fires, dispersion of heavy and buoyant gases in complex environments, jet streams and jet fires, fireballs

- Interaction of a dynamic process simulator with a dynamic accident simulator for operator training simulation
- Virtual and Augmented-virtual reality to enhance the safety of industrial field-operators
- Situation Awareness and Performance Assessment of control room and field operators in the process industry
- Dynamic Conceptual Design of chemical processes. Economic assessment and feasibility study of industrial plants under price volatility, demand uncertainty, and market fluctuations
- Cancer growth models and pharmacokinetic and pharmacodynamics models of cancer drugs
- Quantitative Systems Pharmacology – Individualization of, and intra-/inter-species treatments

### **Publications and patents**

- Author and coauthor of more than 225 publications as books, chapters of books, international and national journals, proceedings to international and national conferences
- Coauthor of an Italian patent in the field of incineration processes

### **Third-party indicators of scientific performance**

- Scopus ranking                      Documents: 108                      Citations: 693                      H-index: 15
- Google Scholar ranking            Documents: 160                      Citations: 1031                    H-index: 17
- ResearchGate ranking            RGscore: 34.07, the score is higher than 92.5% of ResearchGate members  
H-index: 16

### **Links to third-party indicators of scientific performance**

- <https://www.scopus.com/authid/detail.uri?origin=resultslist&authorId=7004223789>
- <https://scholar.google.it/citations?user=zhCxzGUAAAAJ>
- [https://www.researchgate.net/profile/Davide\\_Manca](https://www.researchgate.net/profile/Davide_Manca)
- Scopus Author ID: 7004223789                      ORCID: <http://orcid.org/0000-0003-2055-9752>

Milan, February 14<sup>th</sup>, 2017