

Current Position

- 06/2018–... **MOX - Modeling and Scientific Computing**, Dipartimento di Matematica, Politecnico di Milano.
Associate Professor
- 31/08/2018 **National Scientific Qualification**, Awarded qualification for the position of Full Professor in Numerical Analysis in the National Scientific Qualification (ASN 2012) procedure.
qualification valid until 31/08/2027

Research Interests

High Performance Computing techniques for applications in Computational Electronics, Electrochemistry and Material Science

NURBS based isogeometric discretization of PDEs for Fluid Dynamics, Elasticity and Electromagnetism

Singularly perturbed Advection-Reaction-Diffusion equations

Finite volume and finite element approximation techniques for advection-dominated Advection-Reaction-Diffusion equations

Electrical circuit simulation

Semiconductor device modelling and simulation

Coupling of systems of DAEs and PDEs

Functional iteration techniques for solving systems of non linear PDEs

Previous Research Positions and Education

- 06/2015–06/2018 **MOX - Modeling and Scientific Computing**, Dipartimento di Matematica, Politecnico di Milano.
Assistant Professor (Ricercatore TD tipologia B)
- 12/2009–06/2015 **MOX - Modeling and Scientific Computing**, Dipartimento di Matematica, Politecnico di Milano.
Assistant Professor (Ricercatore TD tipologia A)
- 02/2009–11/2009 **Postdoctoral researcher**, IMATI-CNR, Pavia.
Working in the framework of the EU funded project "Innovative compatible discretization techniques for Partial Differential Equations" (GeoPDEs)
- 10/2007–02/2009 **Postdoctoral researcher and part-time lecturer**, Dublin City University.
School of Mathematical Sciences
- 03/2006–09/2007 **"Experienced Researcher" (Postdoctoral researcher)**, Bergische Universität Wuppertal.
Working in the framework of the Marie Curie Research Training Network CoMSON (Coupled Multiscale Simulation and Optimization in Nanoelectronics) funded by the European Commission

Postgraduate studies

*MOX - Modeling and Scientific Computing,
Dipartimento di Matematica, Politecnico di Milano
P.zza L. da Vinci, 32, 20133 - Milano, Italia*

13/3/2006 **PhD in “Mathematics and Statistics for Computational Sciences” (MaSSC).**
Università degli Studi di Milano

25/07/2002 **MSc degree in Electrical Engineering.**
Politecnico di Milano

10/2004–3/2005 **Marie–Curie fellowship.**
CASA (Centre for Analysis Scientific Computation and Applications) Technical University of
Eindhoven, the Netherlands

Publications

International Journals with Peer Review

- [1] C. de Falco, L. Di Rienzo, N. Ida, and S. Yuferev, Nonlinear Impedance Boundary Condition for 2D BEM To appear in *COMPEL*, 2018.
- [2] J. Sung Min , A. Luzio, W. Park, R. Kim, E. Gann, F. Maddalena, G. Pace, Y. Xu, D. Natali, C. de Falco C., L. Dang, C. R. Mcneill, M. Caironi, Y. Noh, and Y. Kim, High-mobility naphthalene diimide and selenophene-vinylene-selenophene-based conjugated polymer: n-channel organic field-effect transistors and structure-property relationship *Advanced Functional Materials*, 26:4984–4997, 2016. DOI: 10.1002/adfm.201601144.
- [3] P. C. Africa, C. de Falco, F. Maddalena, M. Caironi, and D. Natali. Simultaneous extraction of density of states width, carrier mobility and injection barriers in organic semiconductors. *Nature Scientific Reports*, 7:1–11, 2017. DOI: 10.1038/s41598-017-03882-8.
- [4] M. Manzoni, M. Mameli, C. de Falco, L. Araneo, S. Filippeschi, M. Marengo, Non equilibrium lumped parameter model for pulsating heat pipes: validation in normal and hyper-gravity conditions. *International Journal of Heat and Mass Transfer*, 97:473–485, 2016. DOI: 10.1016/j.ijheatmasstransfer.2016.02.026
- [5] M. Manzoni, M. Mameli, C. de Falco, L. Araneo, S. Filippeschi, M. Marengo, Advanced numerical analysis of a thermally driven slug flow: application to a capillary closed loop pulsating heat pipe, *International Journal for Numerical Methods in Fluids*, 82:375 – 397, 2016. DOI: 10.1002/fld.4222
- [6] J. Corno, C. de Falco, H. De Gersem, S. Schoöps Isogeometric Simulation of Lorentz Detuning in Superconducting Accelerator Cavities *Computer Physics Communications*, 201:1 – 7, 2016. DOI: 10.1016/j.cpc.2015.11.015
- [7] F. Maddalena, C. de Falco, M. Caironi, and D. Natali. Assessing the width of gaussian density of states in organic semiconductors. *Organic Electronics*, 17(0):304 – 318, 2015. DOI: 10.1016/j.orgel.2014.12.001
- [8] R. Sacco, L. Carichino, C. de Falco, M. Verri, F. Agostini, and T. Gradinger. A multiscale thermo-fluid computational model for a two-phase cooling system. *Computer Methods in Applied Mechanics and Engineering*, 2014. DOI: 10.1016/j.cma.2014.08.003
- [9] M. Porro, G. Lanzani, C. de Falco, R. Sacco and M. Verri. Multiscale Simulation of Organic Heterojunction Light Harvesting Devices. *COMPEL Computational Electronics*, 33(4), Jul. 2014. DOI: <https://doi.org/10.1108/COMPEL-12-2012-0365>
- [10] M. Taffetani, C. de Falco, R. Penta, D. Ambrosi, and P. Ciarletta. Modeling in nanomedicine: multi-scale approaches and future challenges. To appear in: *Archive of Applied Mechanics*, 2014. DOI: 10.1007/s00419-014-0864-8

- [11] D. Cagnoni, F. Agostini, T. Christen, C. de Falco, N. Parolini, and I. Stevanović. Multiphysics simulation of corona discharge induced ionic wind. *Journal of Applied Physics*, 114 (23), 2013. DOI 10.1063/1.4843823
- [12] C. de Falco, M. Porro, R. Sacco, and M. Verri. Multiscale modeling and simulation of organic solar cells. *Computer Methods in Applied Mechanics and Engineering*, 245, 2012. DOI: 10.1016/j.cma.2012.06.018
- [13] F. Ciucci, C. de Falco, M. Guzman, S. Lee, and T. Honda. Chemisorption on semiconductors: the role of quantum corrections on the space charge regions in multiple dimensions. *Applied Physics Letters*, 100(18), 2012. DOI: 10.1063/1.4709483
- [14] C. de Falco and E. O’Riordan. A parameter robust petrov-galerkin scheme for advection-diffusion-reaction equations. *Numerical Algorithms*, 56(1):107–127, 2011. DOI 10.1007/s11075-010-9376-y
- [15] A. Buffa, C. de Falco, and G. Sangalli. Isogeometric analysis: Stable elements for the 2d stokes equation. *International Journal for Numerical Methods in Fluids*, 65(11-12):1407–1422, 2011. DOI: 10.1002/fld.2337
- [16] C. de Falco, A. Reali, and R. Vázquez. Geopdes: A research tool for isogeometric analysis of pdes. *Advances in Engineering Software*, 42(12):1020–1034, 2011. DOI: 10.1016/j.advengsoft.2011.06.010
- [17] C. de Falco and E.O’Riordan. Interior layers in a reaction–diffusion equation with a discontinuous diffusion coefficient. *Int. J. Numer. Anal. Model.*, 7(4):444–461, 2010.
- [18] C. de Falco, R. Sacco, and J. Jerome. Quantum corrected drift–diffusion models: Solution fixed point map and finite element approximation. *J. Comput. Phys.*, 228:770–1789, 2009. DOI: 10.1016/j.jcp.2008.11.010
- [19] C. de Falco, R. Sacco, and G. Scrofani. Stabilized 3d finite elements for the numerical solution of Navier-Stokes equations in semiconductors. *Comput. Methods Appl. Mech. Engrg.*, 196:1729–1744, 2007. DOI: 10.1016/j.cma.2006.09.020
- [20] C. de Falco, R. Sacco, and M. Verri. Analytical and numerical study of photocurrent transients in organic polymer solar cells. *Comput. Methods Appl. Mech. Engrg.*, 199:1722–1732, 2010. DOI: 10.1016/j.cma.2010.01.018
- [21] C. de Falco, E. Gatti, A.L. Lacaita, and R. Sacco. Quantum–corrected drift–diffusion models for transport in semiconductor devices. *J. Comput. Phys.*, 204(2):533–561, 2005. DOI: 10.1016/j.jcp.2004.10.029
- [22] G. Cassano, C. de Falco, C. Giulianetti, and R. Sacco. Numerical simulation of tunneling effects in nanoscale semiconductor devices using quantum corrected drift-diffusion models. *Comput. Methods Appl. Mech. Engrg.*, 195(19-22):2193–2208, 2006. DOI: 10.1016/j.cma.2005.05.007

Book chapters

- [1] Hemmerling Marco and de Falco Carlo. *Informed Architecture*, chapter Simple Complexities: An Interdisciplinary Approach Towards Computational Design and Architectural Geometry, pages 19–32. Springer, 2017. DOI: 10.1007/978-3-319-53135-9_3
- [2] Hemmerling Marco, de Falco Carlo, Mazzucchi Alessio, Gastaldin Giancarlo, Oberti Diego, Topchiev Kristiyan, Bugajska Dominika, Zinger Krzysztof, Krishna Atapaka

Peer Reviewed Proceedings of International Conferences

- [1] D. Cagnoni, M. Bellini, J. Vobecký, M. Restelli, and C. de Falco. *An Algorithm for Mixed-Mode 3D TCAD for Power Electronics Devices, and Application to Power p-i-n Diode*, pages 713–720. In *ECMI 2014: Progress in Industrial Mathematics at ECMI 2014* pp 713-720. DOI: 10.1007/978-3-319-23413-7_99
- [2] C. de Falco, L. Di Rienzo, N. Ida, and S. Yuferev. Nonlinear impedance boundary condition for time-domain e-b bem formulation. In *IEEE CEFC 2016 - 17th Biennial Conference on Electromagnetic Field Computation*, page 7815934, 2017. DOI: 10.1109/CEFC.2016.7815934
- [3] J. Corno, C. de Falco, H. D. Gersem, S. Schöps, Isogeometric analysis simulation of tesla cavities under uncertainty, in: R. D. Graglia (Ed.), *Proceedings of the International Conference on Electromagnetics in Advanced Applications (ICEAA) 2015*, IEEE, 2015.
- [4] F. Agostini, T. Gradinger, and C. de Falco. Simulation aided design of a two-phase thermosyphon for power electronics cooling. In *IECON 2011: 37th Annual Conference of the IEEE Industrial Electronics Society*, pages 1560–1565. IEEE, 2011.
- [5] C. de Falco, A. Iacchetti, M. Binda, D. Natali, R. Sacco, and M. Verri. Modeling and simulation of organic solar cells. In J.R. Poirier B. Michielsen, editor, *Scientific Computing in Electrical Engineering SCEE 2010*, pages 329–338. Springer, 2012.
- [6] C. de Falco and R. Sacco. Error estimates for a mixed hybridized finite volume method for 2nd order elliptic problems. *Lecture Notes in Computational Science and Engineering*, 81 LNCSE:109–117, 2011.
- [7] M. Culpò, C. de Falco, and E.O’Riordan. Patches of finite elements for singularly-perturbed diffusion reaction equations with discontinuous coefficients. In A.D. Fitt, J. Norbury, and H. Ockendon, editors, *Proceedings of the 2008 ECMI conference*, volume 15 of *Mathematics in Industry*. Springer-Verlag, 2009.
- [8] C. de Falco and E.O’Riordan. A patched mesh method for singularly perturbed reaction-diffusion equations. In A. Hegarty, N. Kopteva E. O’Riordan, and M. Stynes, editors, *Proceedings of the International Conference on Boundary and Interior Layers - Computational and Asymptotic Methods, Limerick, July 2008*, volume 69 of *Lecture Notes in Computational Science and Engineering*. Springer-Verlag, 2009.
- [9] C. de Falco and E.O’Riordan. Singularly perturbed reaction-diffusion problem with a boundary turning point. In A. Hegarty, N. Kopteva, E. O’Riordan, and M. Stynes, editors, *Proceedings of the International Conference on Boundary and Interior Layers - Computational and Asymptotic Methods, Limerick, July 2008*, volume 69 of *Lecture Notes in Computational Science and Engineering*. Springer-Verlag, 2009.
- [10] M. Culpò, C. de Falco, G. Denk, and S. Voigtmann. Automatic thermal network extraction and multiscale electro-thermal simulation. In Janne Roos and Luis R.J. Costa, editors, *Scientific Computing in Electrical Engineering SCEE 2008*, volume 14 of *Mathematics in Industry*, pages 281–288. Springer-Verlag, 2009.
- [11] G. Ali, A. Bartel, M. Culpò, and C. de Falco. Analysis of a pde thermal element model for electrothermal circuit simulation. In Janne Roos and Luis R.J. Costa, editors,

Proceedings of Scientific Computing in Electrical Engineering (SCEE) 2008, volume 14 of *Mathematics in Industry*, pages 273–280. Springer-Verlag, 2010.

- [12] C. de Falco, G. Denk, and R. Schultz. A demonstrator platform for coupled multiscale simulation. In G. Ciuprina and D. Ioan, editors, *Proceedings of Scientific Computing in Electrical Engineering (SCEE) 2006*, volume 11 of *Mathematics in Industry*, pages 63–72. Springer-Verlag, 2007.
- [13] G. Cassano, C. de Falco, C. Giulianetti, and R. Sacco. Quantum corrected drift–diffusion modeling and simulation of tunneling effects in nanoscale semiconductor devices. In A.M. Anile, G. Alì, and G. Mascali, editors, *Proceedings of Scientific Computing in Electrical Engineering (SCEE) 2004*, volume 9 of *Mathematics in Industry*. Springer-Verlag, 2006.

Other conference proceedings

- [1] C. de Falco and M. Culpò. Dynamical iteration schemes for multiscale simulation in nanoelectronics. In *Proceedings of the 79th GAMM meeting*, volume 8 of *Proc. Appl. Math. Mech. PAMM*, pages 10061 – 10064. WILEY-VCH Verlag, 2008.
- [2] M. Culpò and C. de Falco. Dynamical iteration schemes for coupled simulation in nanoelectronics. In *Proceedings of the 79th GAMM meeting*, volume 8 of *Proc. Appl. Math. Mech. (PAMM)*, pages 10065–10068. WILEY-VCH Verlag, 2008.
- [3] C. de Falco, J.W. Jerome, and R. Sacco. A functional iteration for the quantum drift–diffusion model: existence analysis and numerical approximation. In *Proceedings of the ICIAM 2007 Conference*, volume 7, pages 1130603– 1130604. WILEY-VCH Verlag, 2007.

Patents

- [1] Francesco Agostini, Ivica Stevanovic, Davide Cagnoni, M. Habert, Bruno Agostini, Carlo de Falco, Nicola Parolini. Cooling device for electric appliance, has current source to generate electric field between electrodes, and channels that are provided between tubes to allow flow of fluid stream between tubes through heat exchanger, July 30 2014. EP Patent EP2759782-A1.

MSc Thesis

Italian title Elementi finiti 3D stabilizzati per le equazioni di Navier–Stokes nei semiconduttori
English title Stabilized 3d finite elements for the numerical solution of navier-stokes equations in semiconductors
supervisor Prof. R. Sacco, Dipartimento di Matematica, Politecnico di Milano

PhD Thesis

title Quantum Corrected Drift-Diffusion Models and Numerical Simulation of Nanoscale Semiconductor Devices
supervisor Prof. R. Sacco, Dipartimento di Matematica, Politecnico di Milano

Grants and Industry Funded Projects

2016-2017 **Sviluppo di una metodologia per la modellazione delle perdite nelle armature di cavi tripolari.**
Research project funded by Prysmian S.p.A., Italy

- 2012-2015 **Massively parallel 3D TCAD Simulation of Power Electronics Devices.**
Research project funded by ABB Corporate Research Baden Dättwil, Switzerland
- 2014-2015 **3DSPEED, 3D Simulation of Power Electronics Devices.**
LISA Supercomputing Resource Allocation grant at the italian supercomputing center (CINECA)
- 2013-2014 **PDDD, 3D Power electronics Drift Diffusion Device simulator.**
LISA Supercomputing Resource Allocation grant at the italian supercomputing center (CINECA)
- 2012 **NORDACS, Nonlinear Diffusion Advection Reaction Coupled Systems.**
Italian SuperComputing Resource Allocation (ISCRA) grant at the italian supercomputing center (CINECA)
- 2012 **Mathematical modeling and numerical simulation of a cooling system for a solid state microwave oven.**
Industrial research project funded by Whirlpool Europe s.r.l., Cassinetta di Biandronno (VA), Italy
- 2011-2012 **Mathematical modeling and numerical simulation for a built-in electrical oven.**
Industrial research project funded by Whirlpool Europe s.r.l., Cassinetta di Biandronno (VA), Italy
- 2011 **Mathematical modeling and simulation of air-cooled condenser.**
Industrial research project funded by ABB Corporate Research Baden Dättwil, Switzerland
- 2011-2012 **Feasibility study for massively parallel 3D TCAD simulations..**
Industrial research project funded by ABB Corporate Research Baden Dättwil, Switzerland

Presentations / Communications / Posters

Invited Keynote / Plenary Presentations

- October, 2018 **WIAS, Berlin, Germany, AMASIS 2018, Applied Mathematics and Simulation for Semiconductors.**
Time and Space Adaptive Multidimensional Simulation of Thin-Film Organic Devices
- October, 2017 **University of Catania, Italy, AMATH 2017, 1st Workshop on Advances in Mathematics for Technology.**
Multiscale and Multiphysics Numerical Models For Technology Applications.
- October, 2016 **St. Wolfgang, Austria, SCEE 2016, 11th International Conference on Scientific Computing in Electrical Engineering, Keynote Speech.**
Numerical Modeling of Organic Electronic and Photovoltaic Devices.
- May, 2013 **Las Vegas, USA, FEMTEC 2013, 4th International Congress on Computational Engineering and Sciences, Keynote Speech.**
Using Octave for Engineering Applications.

Invited Presentations

- Nov. 2015 **Max Plank Institut für Plasma Physik, Garching.**
Block Iterations for Coupled Systems of Diffusion Advection Reaction Equations in Semiconductor Simulation
- Nov. 2013 **Graduate School of Computational Engineering, Technische Universität Darmstadt, Seminar Numerische Verfahren der Feldtheorie und des CE.**
IsoGeometric analysis methods for multiphysics problems
- Jul. 2012 **Université de Montréal, Montréal (Canada), Octave Developers Conference.**
Multiphysics PDE Solvers in Octave.
- Nov. 2011 **EPFL - Lausanne, (Switzerland).**
A General Framework for the implementation of Iso Geometric PDE Solvers.
- Nov. 2008 **IMATI, Pavia (Italy).**
Simulazione Numerica di Dispositivi e Sistemi Nanoelettronici.

- Nov. 2008 **National Centre for Plasma Science and Technology (NCPST), Dublin (Ireland).**
Numerical Simulation of Nano-scale Semiconductor Devices.
- Feb. 2007 **Universität Wuppertal, SEMIC 2007.**
Coupled Multiscale Simulation in Nanoelectronics.
- Dec. 2006 **Politecnico di Milano, NanoQ 2006.**
Coupled Multiscale Simulation in Nanoelectronics.
- Feb. 2006 **TU/Wien Vienna (Austria), SEMIC 2006.**
Functional Iteration and Discretization Methods for Quantum-Corrected Drift-Diffusion Models.
- Mar. 2004 **Beijing (China), Workshop on Advances in Mathematical Semiconductor Modelling: Devices and Circuits.**
Quantum-Corrected Drift-Diffusion Models for Transport in Semiconductor Devices.
- Oct. 2005 **Infineon A.G., Munich.**
Quantum Corrected Drift-Diffusion Models and Numerical Simulation of Nanoscale Electron Devices.
- Mar. 2005 **TU/e Eindhoven, CASA Colloquium.**
Efficient algorithms for Quantum Corrected Drift-Diffusion simulation of nanoscale electron devices.
- Contributed Presentations**
- Sept. 2017 **University of Pavia, IGA 2017.**
Domain Structuring using IGA and FEM with Application to Radio Frequency Cavity Simulation.
- Sept. 2012 **ETH Zürich, Scientific Computing in Electrical Engineering (SCEE 2012).**
Numerical Estimation of the Impact of Energetic Disorder on the Low-Frequency CV Characteristics of Organic MOS Structures.
- Jul. 2010 **University of Zaragoza (Spain), BAIL 2010 - Boundary and Interior Layers.**
A Conservative and Monotone Mixed-Hybridized Finite Element Approximation of Transport Problems in Heterogeneous Domains.
- Jul. 2010 **University of Cagliari (Italy), Joint SIMAI/SEMA Conference on Industrial Maths.**
Modeling and simulation of 3rd generation solar cells.
- May 2010 **Paris (France), ECCM 2010 - IV European Conference on Computational Mechanics.**
Isogeometric Analysis for Incompressible Viscous Flows.
- Jan. 2009 **UL Limerick (Ireland), 7th Annual Workshop on Numerical Methods for Problems with Layer Phenomena.**
Capturing the interior layers in reverse-biased P-N junctions.
- Jul. 2009 **Columbus, OH (USA), 10th US National Congress on Computational Mechanics.**
Computational Models for the Simulation of Third Generation Photovoltaic Devices.
- Jul. 2008 **UL Limerick, BAIL 2008 - Boundary and Interior Layers.**
A Patched Mesh Method for Singularly perturbed Reaction-Diffusion Equations
- May 2008 **UCD Dublin, ISSEC - Irish Mechanics Joint Symposium.**
Automatic thermal network extraction and multiscale electro-thermal simulation.
- Ott. 2007 **INdAM, Roma, Multiscale Analysis for Quantum Systems and Applications (MAQSA).**
Coupling of Quantum and Electrothermal Effects in Semiconductor Device Simulation.
- Sep. 2006 **Sinaia (Romania), SCEE 2006.**
A Demonstrator Platform for Coupled Multiscale Simulation
- Feb. 2005 **Milano, Workshop on Recent Advances in Modeling and Simulation of Semiconductor Devices and Circuits (SEMIC 2005).**
Efficient algorithms for Quantum Corrected Drift-Diffusion simulation of nanoscale electron devices.

- Sep. 2004 **Capo d'Orlando (Italy)**, *Scientific Computing in Electrical Engineering (SCEE 2004)*.
Quantum Corrected Drift-Diffusion Modeling and Simulation of Tunneling Effects in Nanoscale Semiconductor Devices.
- Sep. 2004 **Venezia**, *VII Congresso SIMAI*.
Efficient multidimensional simulation of nanoscale electron devices with Quantum Corrected Drift-Diffusion Models.
- Sep. 2003 **Milano**, *XVII^o Congresso UMI*.
Modelli quantistici per la simulazione di dispositivi nanometrici a semiconduttore.

Teaching

As Main Teacher:

- Spring Semester **Advanced numerical methods for engineers.**
2014 Course taught to students in the Ph.D. programme in “Ingegneria e scienze applicate” at
Spring Semester “Università degli Studi di Bergamo”
2015
- Spring Semester **Numerical Methods for Partial Differential Equations.**
2013 Course taught to students in the Ph.D. programme in “Tecnologie per l’energia e l’ambiente” at
“Università degli Studi di Bergamo”
- Winter semester **Integrated Course: Matematica, Module: Elementi di Matematica B.**
2016–... Course taught to 1st year students in the B.Sc. programmes in Architecture at Politecnico di
Milano
- Winter semester **Integrated Course: Architectural Geometry and Advanced Representation,**
2015–... *Module: Parametric Geometry For Architectural Shapes.*
Course taught (in English) to 2nd year students in the M.Sc. programmes in Architecture at
Politecnico di Milano
- Spring semester **Fondamenti di Calcolo Numerico, (Foundations to Numerical Analysis).**
2012–... Course taught to 3rd year students in the B.Sc. programme in Electrical Engineering at
Politecnico di Milano
- Winter semester **Numerical Analysis.**
2011 Course taught (in English) to 2nd year students in the M.Sc. programmes in Tele-
Winter semester com/Automation/Electrical Engineering at Politecnico di Milano
2012
- Spring semester **Linear Mathematics (MS227).**
2008 Course taught to 2nd year students in the BSc. programme in Applied Physics at Dublin City
University
- Winter semester **Numerical Analysis IV, Advanced Topics.**
2006 Course for fourth year students in Applied Mathematics at Bergische Universität Wuppertal

As Instructor:

- Winter semester **Advanced Programming for Scientific Computing.**
2010–... Course taught (in English) to 2nd year students in the M.Sc. programme in Mathematical
Engineering at Politecnico di Milano.
- Spring semester **Elettronica Computazionale, (Computational Electronics).**
2010 Course taught to 2nd year students in the M.Sc. programme in Mathematical Engineering at
Spring semester Politecnico di Milano.
2011
- Spring semester
2012

- Oct 2002–Jan 2003 **Analisi Matematica A e Geometria**, (*Introduction to Mathematical Analysis and Linear Algebra*).
- Oct 2003–Jan 2004 Course taught by Prof. M. Verri to first year students in Mathematical Engineering at Politecnico di Milano
- Mar–Jun 2003 **Calcolo Numerico**, (*Numerical Analysis*).
Course taught by Prof. A. Veneziani to third year students in mechanical engineering at “Università degli Studi di Bergamo”
- Mar–Jun 2003 **Calcolo delle Probabilità e Statistica Matematica A**, (*Introduction to Probability and Statistics*).
- Mar–Jun 2004 Course taught by Prof. M. Verri to first year students in biomedical engineering at Politecnico di Milano
- Oct 2003–Jan 2004 **Metodi Analitici e Numerici per l’Ingegneria Meccanica**, (*Analytical and Numerical Methods in Mechanical Engineering*).
Course taught by Prof. V. Pata and Prof. R. Sacco to third year students in mechanical engineering at Politecnico di Milano
- Mar–Jun 2004 **Calcolo Numerico**, (*Introduction to Numerical Analysis*).
Course taught by Prof. V. Pennati to first year students in mechanical engineering at Politecnico di Milano
- Mar–Jun 2004 **Metodi Numerici per la Microelettronica**, (*Numerical Methods for Microelectronics*).
Course taught by Prof. R. Sacco to fourth year students in electronic engineering at Politecnico di Milano
- Mar–Jun 2009 **Metodi Numerici per l’Ingegneria Civile**, (*Numerical Methods for Civil Engineering*).
Course taught by Prof. R. Sacco to fourth year students in civil engineering at Politecnico di Milano

Past/Current students supervised

Ph.D. in Mathematical engineering:

- 2016-2019 **A. Simona**, *Politecnico di Milano*.
Co-Supervised with Prof. L. Bonaventura of MOX and Prof. S. Schöps of the Graduate School in Computational Engineering, Technical University Darmstadt
- 2015-2018 **P.C. Africa**, *Politecnico di Milano*.
- 2013-2015 **D. Cagnoni**, *Politecnico di Milano*.
- 2013-2015 **E. Danesi**, *Politecnico di Milano*.
- 2014-2017 **J. Corno**, *Politecnico di Milano*.
Co-Supervised with Prof. S. Schöps of the Graduate School in Computational Engineering, Technical University Darmstadt

M.Sc. in Mathematical engineering:

- 2017 **L. Giussani**, *Politecnico di Milano*, Modellizzazione numerica delle perdite elettriche in un cavo elettrico trifase sottomarino.
Co-Supervised with Prof. Luca Di Rienzo, DEIB
- 2016 **L. Bombardieri**, *Politecnico di Milano*, Modelisation Of A Pulsationg Heat Pipe.
- 2015 **P.C. Africa**, *Politecnico di Milano*, Numerical Modeling of Organic Thin Film Transistors.
- 2015 **M. Pollini**, *Politecnico di Milano*, Simulazioni multiscala dell’efficienza di assorbimento di nanoparticelle per trasporto di farmaco.
- 2014 **R. Di Bella**, *Politecnico di Milano*, IGBT and Power Diode Automated Parameter Extraction Procedure.
Co-supervised with Dr. M. Bellini and Dr. I. Stevanovic of ABB Corporate Research

- 2014 **S. Lunardi**, *Politecnico di Milano*, Simulazione microscala dell'efficienza di assorbimento di nanoparticelle per trasporto di farmaco.
Co-supervised with Dr. M. Taffetani
- 2014 **E. Bulgarello, S. Frizziero**, *Politecnico di Milano*, Isogeometric Simulation of the Perfusion Characteristic in the Liver Tissue.
Co-supervised with Dr. M. Taffetani and Dr. L. Sironi
- 2013 **J. Corno**, *Politecnico di Milano*, IsoGeometric Simulation of Lorentz Detuning.
- 2012 **D. Cagnoni**, *Politecnico di Milano*, Finite Volume Electrohydrodynamic Simulations of Corona Discharge in Air.
Co-supervised with Dr. N. Parolini, Dr. I. Stevanovic (ABB Research) and Dr. F. Agostini (ABB Research)
- 2010 **L. Carichino**, *Politecnico di Milano*, Computational models for power electronics cooling systems.
Co-supervised with Prof. R. Sacco and Prof. M. Verri and Dr. F. Agostini (ABB Research)
- 2010 **M. Cogliati, M. Porro**, *Politecnico di Milano*, Third Generation Solar Cells: Modeling and Simulation.
Co-supervised with Prof. R. Sacco and Prof. M. Verri
- 2009 **M. Favino**, *Politecnico di Milano*, Mathematical Modeling and Numerical Simulation of Third Generation Solar Cells.
Co-supervised with Prof. R. Sacco and Prof. M. Verri
- M.Sc. in Electrical engineering:**
- 2013 **F. Mauri**, *Politecnico di Milano*, Simulazione parallela di dispositivi di potenza.
Co-supervised with Dr. M. Restelli (Max Planck Institut für Plasma Physik) and Dr. M. Bellini (ABB Research)
- 2004 **G. Cassano, C. Giulianetti**, *Politecnico di Milano*, Simulazione Numerica di Dispositivi Nanometrici con Modelli Drift-Diffusion a Correzione Quantistica.
Co-supervised with Prof. R. Sacco
- .
- B.Sc. in Mathematical engineering:**
- 2013 **G. Abbati**, *Politecnico di Milano*, Monte-Carlo simulation of hopping charge transport in polymers.
Co-supervised with Prof. M. Verri
- AA 2012–2013 **F. Labriola, G. Testa**, *Politecnico di Milano*, Un modello matematico per la diffusione dell'attività criminale nelle aree metropolitane.
Supervisione in collaborazione con Prof. M. Verri
- 2011 **F. Destefano**, *Politecnico di Milano*, Stima di parametri per modelli numerici di fotorivelatori organici.
Co-supervised with Dr. D.A.N. Natali

International Journals for which I have been acting as a reviewer

Journal Of Computational Physics
 Computer Methods in Applied Mechanics and Engineering
 Applied Mathematics and Computation
 Journal of Computational and Applied Mathematics
 Mathematical Modelling and Numerical Analysis
 Mathematical and Computer Modelling
 Applied Mathematics Letters
 Computers and Mathematics with Applications

Computer Aided Graphics Design
Thin Solid Films
Journal of Nanoscience and Nanotechnology
SIAM Journal on Numerical Analysis
SIAM Journal on Scientific Computing

Organization of international workshops

- Apr. 2018 **CERN - Geneve**, *OctConf2018 7th International workshop for GNU Octave users and developers.*
- Jun. 2013 **MOX - Politecnico di Milano**, *OctConf2013 3rd International workshop for GNU Octave users and developers.*
- Feb. 2005 **MOX - Politecnico di Milano**, *SEMIC 2005 Recent Advances in Modeling and Simulation of Semiconductor Devices and Circuits.*
- Feb. 2007 **Universität Wuppertal**, *1st CoMSON Demonstrator Platform Course.*

Ongoing and Past Software Projects

I am currently managing or contributing to the following software projects

- Octave <http://www.octave.org>, A high-level language, primarily intended for numerical computations.
- Octave-Forge <http://octave.sf.net>, A central location for the collaborative development of packages for GNU Octave.
- GeoPDEs <http://www.imati.cnr.it/geopdes/>, A software suite for research on Isogeometric Analysis.
- BIM++ <http://redmine.mate.polimi.it/projects/bim>, A C++ library with utility classes and methods for developing applications that solve Diffusion-Advection-Reaction PDEs..
- CGDD++ <https://redmine.mate.polimi.it/projects/cgdd>, CGDD++ is an evolution of the CGDD 3D Parallel Semiconductor device simulator, written in C++ and based on the BIM++ library, implementing the Drift-Diffusion model for charge transport in semiconductors, with very general boundary conditions..
- LifeV <http://www.lifev.org/>, A finite element (FE) library providing implementations of state of the art mathematical and numerical methods.
- In the past, I have been contributing to the following software projects
- TITAN <http://www.infineon.com>, The in-house analog circuit simulator of Infineon, AG.

Languages

Italian Native
English Fluent
German Functional
Danish, Dutch Elementary

Consapevole delle sanzioni penali, nel caso di dichiarazioni non veritiere, di formazione o uso di atti falsi richiamate dall'art. 763³ del D.P.R. 445 del 28 dicembre 2000, nonché della sanzione ulteriore prevista dall'art. 754⁴ del citato D.P.R. 445 del 28 dicembre 2000, consistente nella decadenza dai benefici eventualmente conseguenti al provvedimento emanato sulla base della dichiarazione non veritiera, dichiaro che tutte le informazioni contenute nel presente curriculum corrispondono a verità.