Giorgio Stefano Gnecco – Curriculum Vitae

Born in Genoa (Italy), 01/03/1979

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Present position

Full Professor in Mathematical Methods of Economics and of Actuarial and Financial Sciences at IMT Lucca, working in the AXES (Laboratory for the Analysis of compleX Economic Systems) Research Unit.

Past positions

From 01/03/2020 to 31/05/2024: Associate Professor in Operations Research at IMT Lucca, working in the AXES (Laboratory for the Analysis of compleX Economic Systems) Research Unit.

From 19/09/2022 to 18/09/2023: one-year external collaboration with the Dept. of Mechanical, Energy, Management and Transport Engineering (DIME) - University of Genoa, as Contract Professor for the Master Course “Game Theory” (54 hours).

From 20/09/2021 to 19/09/2022: one-year external collaboration with the Dept. of Mechanical, Energy, Management and Transport Engineering (DIME) - University of Genoa, as Contract Professor for the Master Course “Game Theory” (54 hours).

From 23/09/2019 to 22/09/2020: one-year external collaboration with the Dept. of Civil, Chemical, and Environmental Engineering (DICCA) - University of Genoa, as Contract Professor for the Bachelor Course “Calculus 1” (120 hours).

From 01/03/2017 to 29/02/2020: Tenure-Track Assistant Professor (“Ricercatore Tipo B”) in Operations Research at the IMT - School for Advanced Studies, Lucca, working in the AXES (Laboratory for the Analysis of compleX Economic Systems) Research Unit.

From 01/02/2017 to 28/02/2019: two-years external collaboration (while working as Assistant Professor at the IMT - School for Advanced Studies, Lucca) with the Dept. of Computer Science, Bioengineering, Robotics, and Systems Engineering (DIBRIS) - University of Genoa (Prof. G. Volpe) on “*Application of Graph-Analysis Techniques to the Study of Motion Performance of Violin Players to Design Violin Teaching Supporting*

Systems". The collaboration is in the context of the EU research project 2016-2018 H2020 ICT TELMI (Technology Enhanced Learning of Musical Instrument performance: http://telmi.upf.edu).

From 11/07/2016 to 04/10/2022: Director of the local Research Unit of INdAM (National Institute for Advanced Mathematics) at the IMT - School for Advanced Studies, Lucca: https://www.imtlucca.it/research/research-units/indam (the position could be held for 3 years possibly followed by a 3-years renewal).

From 06/09/2013 to 28/02/2017: Fixed-term Assistant Professor ("Ricercatore Tipo A") in Control Systems at the IMT - School for Advanced Studies, Lucca (position renewed on 06/09/2016), working in the DYSCO Research Unit.

From 01/03/2013 to 05/09/2013: Post-Doc at the Dept. of Computer Science, Bioengineering, Robotics, and Systems Engineering (DIBRIS) - University of Genoa. Title of the research project: "*Graph Processing through Machine Learning, Optimization, and Non-Linear Approximation*".

2013: first on the list in the international competition for an Assistant Professor position (Fixed-Term Researcher) in Control Systems at the IMT - School for Advanced Studies, Lucca.

From 01/03/2011 to 29/02/2012: Post-Doc at the Dept. of Communications, Computer, and System Sciences (DIST) - University of Genoa and, from 01/03/2012 to 28/02/2013: Post-Doc at the Dept. of Computer Science, Bioengineering, Robotics, and Systems Engineering (DIBRIS) - University of Genoa. Title of the research project: "*Methodologies and Algorithms for the Approximate Solution of Infinite-Dimensional Non-Linear Programming Problems, with Applications to Optimization over Stages, to Team Decisional Processes, and to Telecommunications*".

From 05/04/2011 to 04/05/2011: collaboration with the Dept. of Communications, Computer, and System Sciences (DIST) – University of Genoa (Prof. R. Zoppoli), on "*Comparison between Linear and Nonlinear One-Hidden Layer Approximating Networks*".

From 02/01/2009 to 01/01/2010: Post-Doc at the Dept. of Computer and Information Science (DISI) – University of Genoa and, from 02/01/2010 to 01/01/2011: Post-Doc at the Dept. of Communications, Computer, and System Sciences (DIST) – University of Genoa. Title of the research project: "*Solution of Functional Optimization Problems through Regularization Techniques, Nonlinear Approximation, and Machine Learning*".

2005: collaboration with the Dept. of Biophysical and Electronic Engineering (DIBE) – University of Genoa (Prof. B. Bianco) on "*Definition of Optimality Criteria for the Choice of the Parameters for the Cole-Davidson Model, and Application to a Particular Case*".

Italian National Scientific Qualifications as Full Professor

10/10/2022: Italian National Scientific Qualification for the role of Full Professor in Information Processing Systems (ING-INF/05).

29/04/2021: Italian National Scientific Qualification for the role of Full Professor in Computer Science (INF/01).

20/04/2021: Italian National Scientific Qualification for the role of Full Professor in Mathematical Methods of Economics and of Actuarial and Financial Sciences (SECS-S/06).

24/09/2018: Italian National Scientific Qualification for the role of Full Professor in Operations Research (MAT/09).

Studies

Beginning of 2009: Ph.D. in Mathematics and Applications (Ph.D. code: DOT0311253) at the University of Genoa. Title of the Ph.D. thesis: "*Functional Optimization by Variable-Basis Approximation Schemes*". Supervisor: Prof. Marcello Sanguineti.

From 01/01/2006 to 31/12/2008: Ph.D. student in Mathematics and Applications (Ph.D. code: DOT0311253) at the University of Genoa.

2005: qualified in the competition for the Ph.D. in Mathematics and Applications (Ph.D. code: DOT0311253) at the University of Genoa. Three-years fellowship.

2005: qualified in the competition for the Ph.D. in Computer Science (Ph.D. code: DOT03C6252) at the University of Milano-Bicocca, Italy.

2005: qualification test ("Esame di Stato") for the profession of Engineer.

End of 2004: "Laurea Quinquennale" (Master's Degree) in Telecommunications Engineering (110/110 cum Laude). Title of the thesis: "*Application of Support Vector Machines to Optimal Control Problems*". Supervisors: Proff. Marcello Sanguineti and Riccardo Zoppoli. Average examination mark before the thesis defense: about 29.54/30.

2001: Diploma in viola (10-years degree, recognized as a Master's Degree - Italian Stability Law 228/2012). Main viola teacher: Igor Polesitsky.

2000: Diploma in violin (10-years degree, recognized as a Master's Degree - Italian Stability Law 228/2012). Main violin teacher: Igor Polesitsky (Orchestra del Maggio Musicale Fiorentino, Florence, Italy).

1997: "Maturità Scientifica" at Liceo Scientifico "M. L. King", Genoa, Italy (60/60).

Research topics

In the following, I report a list of my main research topics. A detailed description is provided later.

1. ***Machine learning theory and applications.***
2. ***Computational methods for infinite-dimensional optimization problems.***
3. ***Computational aspects of neural networks.***

4. ***Control of deterministic and stochastic dynamical systems, and its applications to economics.***
5. ***Stochastic team optimization problems and their applications to economics.***
6. ***Optimal state estimation of dynamical systems.***
7. ***Call admission control and network congestion control.***
8. ***Consensus problems in multi-agent systems and distributed scheduling in cloud computing.***
9. ***Cooperative and noncooperative games, and their applications to economics.***
10. ***Optimization methods for the design of innovative materials.***

Among the applications that I have considered and studied by using the methodologies and algorithms I have developed (and often implemented personally), there are:

– applications of matrix completion to economic complexity, input-output analysis of trade, pollution data, labor force data;
– applications of game theory to transboundary pollution, parallel trade of pharmaceuticals, pension systems, and transport networks;
– applications of machine learning to finance;
– classification of the flooding risk;
– optimization problems for insurance applications;
– optimization problems involving price-volume agreements;
– optimal consumption under either certainty or uncertainty;
– production control in multi-divisional firms;
– application of econometric techniques to the analysis of leadership in human movement;
– machine-learning problems in the presence of several kinds of constraints modeling the knowledge available to the learning machine (e.g., boundary conditions, holonomic constraints, isoperimetric constraints, supervised examples and supervised regions, symmetry/antisymmetry constraints);
– online learning problems, investigated through optimal control techniques using random matrices;
– applications of support vector machines to the classification of medical images;
– image segmentation problems;
– applications of machine-learning and cooperative game theory techniques to the analysis of social signals in groups of individuals;
– development of machine-learning methods for the automatic analysis of the perceived origin of movement;
– call admission control in cellular networks with several classes of users, and in the presence of limited resources;
– congestion control in intermittently-connected mobile networks;
– ray-tracing algorithms for light propagation;
– optimization problems over graphs modeling sensor networks, in the presence of “communication costs” associated with the edges of the graphs;
– optimization problems modeling distributed task scheduling in cloud computing;
– band gap optimization for the design of mechanical structures based on innovative metamaterials, with potential applications, e.g., in aerospace engineering, bioengineering, and robotics.

Journal choices. In the following table, I report some data about a selection of the international journals where I published my papers.

International Journal	2023 IMPACT FACTOR	H-INDEX
Composites Part B: Engineering (1 paper)	12.7	132
IEEE Transactions on Neural Networks and Learning Systems (1 paper)	10.2	196
Engineering Applications of Artificial Intelligence (2 papers)	7.5	93
International Journal of Mechanical Sciences (1 paper)	7.1	111
Computer Methods in Applied Mechanics and Engineering (1 paper)	6.9	182
IEEE Transactions on Network Science and Engineering (1 paper)	6.7	16
European Journal of Operational Research (1 paper)	6.0	260
Neural Networks (2 papers)	6.0	136
Journal of Hydrology (1 paper)	5.9	208
Transportation Research Part B - Methodological (1 paper)	5.8	130
Neurocomputing (3 papers)	5.5	123
Annals of Operations Research (3 papers)	4.4	96
Human Behavior and Emerging Technologies (1 paper)	4.3	34
Machine Learning (1 paper)	4.3	144
Minds and Machines (1 paper)	4.2	39
Computers & Operations Research (1 paper)	4.1	143
Human-Centric Computing and Information Sciences (1 paper)	3.9	46
Scientific Reports (3 papers)	3.8	242
IEEE Communications Letters (3 papers)	3.7	136
Smart Materials and Structures (1 paper)	3.7	144
ACM Transactions on Interactive Intelligent Systems (1 paper)	3.6	30
Group Decision and Negotiation (1 paper)	3.6	57
Transportmetrica A: Transport Science (1 paper)	3.6	34
Applied Mathematics and Computation (1 paper)	3.5	135
IEEE Transactions on Human-Machine Systems (1 paper)	3.5	115
International Journal of Data Science and Analytics (1 paper)	3.4	24
Parkinsonism & Related Disorders (1 paper)	3.1	92
Soft Computing (4 papers)	3.1	73
IEEE/ACM Transactions on Networking (1 paper)	3.0	165
Neural Computation (4 papers)	2.7	157
Frontiers in Materials (1 paper)	2.6	19
Neural Processing Letters (1 paper)	2.6	50
SIAM Journal on Optimization (1 paper)	2.6	115

The World Economy (1 paper)	2.6	72
IEEE Control Systems Letters (2 papers)	2.4	32
Acta Mechanica (1 paper)	2.3	70
IEEE Transactions on Information Theory (1 paper)	2.2	260
Journal on Multimodal User Interfaces (1 paper)	2.2	24
EURO Journal on Transportation and Logistics (1 paper)	2.1	26
Frontiers in Mechanical Engineering (1 paper)	2.0	22
4OR: A Quarterly Journal of Operations Research (1 paper)	1.7	38
Computational Optimization and Applications (2 papers)	1.6	71
Irrigation and Drainage (1 paper)	1.6	35
Journal of Optimization Theory and Applications (7 papers)	1.6	82
Networks (3 papers)	1.6	59
Journal of Inequalities and Applications (1 paper)	1.5	42
AStA Advances in Statistical Analysis (1 paper)	1.4	28
Annals of Applied Statistics (1 paper)	1.3	75
Applied Network Science (1 paper)	1.3	27
Computational Management Science (2 papers)	1.3	36
Mathematical Foundations of Computing (1 paper)	1.3	4
Optimization Letters (7 papers)	1.3	36
Italian Economic Journal (2 papers)	1.2	11
Journal of Applied Mathematics (1 paper)	1.2	56
Journal of Pension Economics and Finance (1 paper)	1.0	26
Performance Evaluation (1 paper)	1.0	63
Electronics Letters (1 paper)	0.7	142
Information Processing Letters (1 paper)	0.7	73
International Game Theory Review (1 paper)	0.4	25
Journal of Dynamical Systems and Geometric Theories (1 paper)	0.4	42
International Journal of Arts and Technology (1 paper)	0.2	20

In the following, I describe in detail each of my main research topics, pointing out the related refereed publications (some publications are related to more than one topic).

1) Machine learning theory and applications

- *Papers in refereed international journals: [IJ1, IJ2, IJ3, IJ4, IJ5, IJ6, IJ8, IJ9, IJ12, IJ13, IJ15, IJ18, IJ19, IJ20, IJ22, IJ23, IJ25, IJ27, IJ30, IJ31, IJ33, IJ35, IJ36, IJ37, IJ42, IJ45, IJ49, IJ54, IJ55, IJ58, IJ59, IJ60, IJ63, IJ64, IJ65, IJ66, IJ68, IJ69, IJ70, IJ71, IJ74, IJ76, IJ77, IJ78, IJ80, IJ81, IJ83, IJ96, IJ97, IJ98, IJ99, IJ101, IJ102, IJ107]*
- *Book: [B1]*
- *Book chapters and international conference papers, with revision of the full paper: [BC1, BC2, BC3, BC5, BC6, BC8, BC11, BC13, LN1, LN4, LN5, LN6, LN7, LN8, LN9, LN10, LN11, CP1, CP2, CP3, CP5, CP6, CP7, CP10, CP11, CP15, CP16, CP17, CP19, CP20, CP21, CP23]*

In the machine-learning field, part of my research activity was devoted to the investigation of suboptimal solutions to both supervised and unsupervised learning problems using kernel methods. Such techniques map (usually nonlinearly) the input data to a second (typically infinite-dimensional) space, and apply in such a space linear techniques of supervised or unsupervised learning. To this aim, they compute the inner products in such a space using a function which is called “kernel”. Such machine learning methods are very important in computer science/information processing systems, and are becoming increasingly of interest also in economic applications related, e.g., to econometrics. Finally, techniques from operations research are extremely useful to investigate such machine learning methods.

As concerns supervised learning, I have considered various forms of regularization (e.g., Tikhonov's regularization and weight decay). In the context of unsupervised learning, my research activity has been devoted to Kernel Principal Component Analysis. In both cases, I have investigated the accuracy of suboptimal solutions when varying the number of parameters to be optimized for certain nonlinear approximation schemes. Among the techniques that I have used, a relevant role was played by tools coming from statistical learning theory, which often allows one to keep under control the difference between the expected risk and the empirical risk. In particular, I have applied such techniques to a new framework of supervised learning with constraints modeling prior knowledge, for which I have developed theoretical results (e.g., structure of their optimal solutions in terms of suitable Green’s functions) and obtained numerical results, solving numerically suitable partial differential equations. The constraints that I have considered are, e.g., boundary conditions and holonomic/isoperimetric constraints, which I have investigated for both the hard and soft cases. I have also investigated how much the optimal solutions to such learning problems change when perturbing some constraints. Moreover, I have investigated the role of additional unsupervised examples to discretize the constraints. Finally, I have also investigated the so-called box-kernels, which provide a way to embed additional knowledge, modeled by logical constraints, into a learning problem. An example is the knowledge coming from a set of logical rules coming from a doctor’s experience to detect a disease.

As concerns real-world applications, I have applied machine learning techniques to the classification of flood-prone areas from remote sensed elevation data, comparing several binary and multi-class classifiers. The results are of interest, among others, in insurance applications. For this problem, I have also compared a semi-supervised and a fully supervised approach to the classification of the flooding risk. The comparison is particularly significant for the case - typical of this important application - in which there is a limited availability of supervised examples, due their high cost of acquisition. In other works, I have performed a natural disaster risk analysis for Italy, and investigated its application in insurance.

In the EU research project SIEMPRE (Social Interaction and Entrainment using Music PeRformancE), I have also studied some applications of machine learning to music (finding features able to discriminate between different performing conditions of music pieces played by real orchestras and string quartets, and detecting leading interactions). In this context, I have also investigated the application of tools from cooperative game theory (in particular, the Shapley value) to estimate the importance of each musician in following a particular point of interest (e.g., the conductor in the case of the orchestra). In the EU research project TELMI (Technology Enhanced Learning of Musical Instrument performance), I have combined my competencies in machine learning and in music to define suitable features (to

be measured automatically using motion capture techniques) to help student musicians in detecting wrong movements in the absence of the teacher. I have also developed a method for the automatic analysis of the perceived origin of human movement, based on tools from graph theory and game theory. Moreover, I have developed dynamic graph neural network models and applied them to the analysis of financial data. Finally, I have investigated mid-level movement qualities (leadership, cohesion, fluidity) using motion-capture data.

As an application of machine learning to image processing, I have developed neural-network-based active contour models for image segmentation considering both the supervised case and the unsupervised case, and coauthoring also a survey paper on the topic. Applications of such models have been natural image segmentation and medical image segmentation. I have also applied support vector machines to the classification of several Parkinsonian disorders, using features derived from medical images.

I have developed an algorithm for curve identification in the presence of intersections. Among others, the algorithm has applications in dispersion curve identification arising in wave propagation problems, and in trajectory identification.

I have studied theoretically how to enforce symmetry and antisymmetry properties to the optimal solutions of machine learning problems, and also to the suboptimal ones generated by iterative algorithms such as the Sequential Minimal Optimization (SMO) algorithm. The study has been inspired by a real applicative context of machine-learning techniques in the analysis of motion capture data, for which such properties were empirically observed. Then, I have investigated the application of the symmetry/antisymmetry properties above to the problem of learning the weights of the edges in a graph. In another study, I have extended the investigation of symmetry and antisymmetry properties to the optimal solutions of some regression problems.

In a series of works, I have applied statistical learning theory techniques to compare simple and complex models in supervised machine learning, and I have studied, from both a theoretical and applicative viewpoint, a novel formulation of online supervised learning as an optimal control problem with random matrices associated with the incoming examples. I have also investigated the trade-off between number of examples and precision of supervision in regression problems based on ordinary least squares, combining machine learning with methods from econometrics. I have also combined machine learning with causal inference to investigate heterogeneous treatment effects, and I have applied machine learning techniques to family business status classification. Moreover, I have studied algorithms for parameter estimation in an exponential random graph model for social network analysis. I have also combined techniques from machine learning and from causal inference. Moreover, I have investigated the trade-off between number of examples and precision of supervision in machine-learning problems, considering the cases of ordinary least squares and weighted least squares, and applying econometrics tools in the analysis. In another work, I have considered also an approach based on statistical learning theory. Then, I have also extended the analysis of the trade-off between precision of supervision and number of supervised examples to the balanced and unbalanced fixed effects panel data models. In another work, I have further extended the analysis to the fixed effects generalized least squares model.

In recent works, I have applied matrix completion to input-output tables, then I have defined a novel economic complexity index based on matrix completion. I have also applied matrix completion to a dataset related to pollution, and to professions/skills matrices. I have

also applied matrix completion to world trade data, using Shapley values for the interpretability of the results obtained. In the ongoing work [WR1] with Federico Nutarelli and Massimo Riccaboni (IMT - School for Advanced Studies, Lucca), and Samuel Edet (International Finance Corporation, Washington), we have applied matrix completion to investigate the economic complexity of cities.

I have surveyed machine-learning techniques for breast cancer detection. In the ongoing work [WR2] with Paolo Barbieri, Jacopo Frascaroli, Francesca Piovesan, Irene Ronga and P. Sarasso (University of Turin), and Martina Berto, Davide Bottari and Giacomo Handjaras (IMT - School for Advanced Studies, Lucca), we have applied machine learning to functional Magnetic Resonance Imaging (fMRI) data.

2) Computational methods for infinite-dimensional optimization problems

- *Papers in refereed international journals: [IJ54, IJ62, IJ63, IJ64, IJ67, IJ75, IJ76, IJ80, IJ81, IJ82, IJ84, IJ86, IJ87, IJ88, IJ89, IJ90, IJ92, IJ93, IJ94, IJ95, IJ99, IJ100, IJ102, IJ103, IJ104, IJ105, IJ107, IJ107]*
- *Book: [B1]*
- *Book chapters and international conference papers, with revision of the full paper: [BC14, CP24]*

In this context, I have focused my attention on the search for suboptimal solutions expressed as functions with a fixed structure, in which a certain number of parameters has to be optimized. For example, this is the case with linear combinations of Gaussians with variable centers and variances: the coefficients of the combinations, together with the components of the vectors representing the centers and the variances, are the parameters to be optimized. Quite intuitively, the need to have a small computational effort - in terms of both time and memory requirements - associated with the search for good parameter values motivates the interest in suboptimal solutions containing a small number of such parameters.

My research activity in this field has been devoted to the investigation of infinite-dimensional optimization problems for which, by means of suitable choices of the structures of parameterized suboptimal solutions, one can cope with the so-called “curse of dimensionality”, i.e., a rapid increase (typically, an exponential increase), with respect to the number of arguments of the admissible functions, of the number of parameters required to guarantee a desired accuracy of suboptimal solutions. The problems that I have investigated belong mainly to the fields of machine learning, optimization over stages, and team optimization.

3) Computational aspects of neural networks

- *Papers in refereed international journals: [IJ43, IJ62, IJ67, IJ75, IJ76, IJ84, IJ86, IJ87, IJ88, IJ89, IJ90, IJ92, IJ93, IJ94, IJ95, IJ104, IJ106, IJ107]*
- *Book: [B1]*
- *Book chapters and international conference papers, with revision of the full paper: [BC14, LN11, LN12, CP24]*

The approximation capabilities of families of function approximators can be fruitfully exploited in the search of suboptimal solutions to infinite-dimensional optimization problems. In particular, my research activity in this field has been devoted to the investigation of structural properties (e.g., smoothness) of the optimal solutions to various kinds of infinite-

dimensional optimization problems, in order to choose function approximators that are suitable to each given problem, and to analyze the quality of the associated suboptimal solutions, in dependence of the total number of parameters.

The connections between the problem of function approximation and the one of infinite-dimensional optimization have motivated my investigation of the comparison between the approximation capabilities of certain linear and nonlinear approximation schemes, and the study of new approximation error bounds for some families of functions. I have applied the obtained estimates in the "sup-norm" to optimization problems over stages and to the search for approximate solutions to Fredholm integral equations. Instead, I have exploited the error bounds in the "L_2 norm" for the solution of a class of team optimization problems. I have also derived estimates for the approximation error in Reproducing Kernel Krein Spaces used in learning with indefinite kernels (instead of the classical positive-semidefinite ones).

I have investigated the relationships between "classical" norms (e.g., Lebesgue's and Sobolev's ones) and a norm known in the literature as "variation norm", which is associated with the kind of basis functions used in nonlinear approximation schemes. Such a norm plays a relevant role in estimating the accuracies of suboptimal solutions to infinite-dimensional optimization problems.

I have studied a class of infinite-dimensional optimization problems for which I have proved that the classical Ritz method really incurs the curse of dimensionality (which was conjectured, but not proved, in the past literature). The result provides an additional theoretical motivation for alternative solution approaches, such as the ERIM, besides the ones already investigated in past works. Moreover, I have investigated the effectiveness of neural networks with random weights.

Finally, I have specialized the general methodology described above to some families of particularly important infinite-dimensional optimization problems: optimization over stages, team optimization, and machine learning.

4) Control of deterministic and stochastic dynamical systems, and its applications to economics

- *Papers in refereed international journals: [IJ10, IJ43, IJ62, IJ73, IJ75, IJ79, IJ82, IJ91, IJ93, IJ106]*
- *Book: [B1]*
- *Book chapters and international conference papers, with revision of the full paper: [BC12, CP24, CP25, CP26, CP27]*

In optimization problems over stages, a Decision Maker (DM) has to take sequential decisions, in such a way to minimize a given cost (or maximize a given reward) expressed as the summation of costs associated with each decisional stage. The decisions are obtained via strategies, which are functions whose list of arguments contains the decisional variables. Such problems have a variety of applications in engineering (e.g., in the optimal control of dynamical systems), but also in economics, such as in production planning, portfolio optimization, and optimal choice of consumption. They can be applied also to online machine learning.

In such problems, nonlinear approximators can be used to approximate either the optimal strategies of the DM or the so-called "optimal cost-to-go functions" or "value functions" in

Approximate Dynamic Programming (ADP), a technique used to solve approximately Bellman's equation arising in Dynamic Programming (DP). In both cases, I have derived conditions under which certain nonlinear approximation schemes are able to mitigate the curse of dimensionality: i.e., the number of parameters that is necessary to guarantee a given accuracy of suboptimal solutions depends in a “mild way” (polynomially) on the number of decisional variables. Such conditions include the interiority of the optimal strategies, convexity properties of the transitional and final costs, and a degree of smoothness that is proportional to the number of decisional variables.

Among the problems that I have investigated in this context, there are perturbations of the classical LQ and LQG problems in optimal control and optimal consumption (in both deterministic and stochastic versions), for which I have developed both theoretical investigations and numerical simulations. Moreover, I have applied a dynamic programming approach to study strong convexity and smoothness of solutions to geometric optics problems, and I have also investigated, for such problems, computational advantages of dynamic programming with respect to other numerical methods.

For the case in which the number of parameters of the nonlinear approximation schemes varies among the stages, I have investigated, both theoretically and numerically, the optimization problem associated with the determination of the optimal distribution of the number of parameters among the stages. I have also studied the application of nonlinear approximators to the optimal control of stochastic bilinear systems, under both a finite-optimization horizon framework and an infinite-optimization horizon one.

Finally, I have investigated feedback stabilization of uncertain dynamical systems.

5) Stochastic team optimization problems and their applications to economics

- *Papers in refereed international journals: [IJ84, IJ86, IJ100]*
- *Book: [B1]*
- *Book chapters and international conference papers, with revision of the full paper: [LN16, CP28]*

Stochastic team optimization problems are characterized by the simultaneous presence of several Decision Makers (DMs) with partial and individual information on the environment they interact with, but having a common objective. Such problems model many optimization contexts and have various applications, such as bandwidth allocation and congestion control.

My research activity in this field has been devoted to the study of problems with only one decisional stage, since several stochastic team optimization problems can be formulated in this context or can be reduced to it (e.g., the classical “Witsenhausen's counterexample”). I have studied smoothness properties of the optimal strategies in production planning problems in the presence of decentralization. For the famous and still unsolved “Witsenhausen's counterexample”, I have estimated the accuracies of certain kinds of suboptimal solutions. I have considered simplifications arising in team optimization problems (with respect to their general formulation) when the interaction among the decision makers is limited and is modeled by a graph of the interactions (“Network Team Optimization Problems”).

6) Optimal state estimation of dynamical systems

- *Papers in refereed international journals: [IJ93, IJ105]*
- *Book chapters and international conference papers, with revision of the full paper: [CP24]*

Solving optimal state estimation problems for nonlinear dynamical systems is a very complex task. In general, they entail infinite-dimensional optimization, as the estimates are generated by using functions whose arguments are the measurements made on the dynamical system. Often, in this framework, one is interested in determining an optimal function (usually belonging to an infinite-dimensional space) with respect to a suitable objective functional related to the estimation error.

My research in this field has dealt with the investigation of methodologies of approximate solution, based on the use of estimation functions with a fixed structure, containing parameters to be optimized (for instance, splines and linear combinations of Gaussians with varying centers and widths). Solving the associated nonlinear programming problems allows one to obtain minimizing sequences, i.e., sequences of functions whose values of the objective functional converge to the optimal one. As a first step, I have studied conditions for convergence. As a second step, I have investigated their rate of convergence.

7) Call admission control and network congestion control

- *Papers in refereed international journals: [IJ52, IJ72, IJ73, IJ79, IJ85, IJ91]*
- *Book chapters and international conference papers, with revision of the full paper: [CP25, CP26, CP27]*

A first part of my research activity in this field has been devoted to the study of structural properties of the optimal solutions to certain problems of generalized knapsack, formulated in a stochastic context. Such problems arise, e.g., in Call Admission Control for telecommunications networks with admission regions characterized by nonlinear constraints. This covers a major importance when one wants to impose given requirements of Quality of Service (QoS) on the ongoing connections, minimizing at the same time the probability that an incoming request of connection is rejected by the admission control system. The combinatorial optimization problem known as “generalized stochastic knapsack” is characterized by nonlinearities in both the objective function and the constraints; for this reason, “ad hoc” techniques are required to solve it. Note that even its simplified deterministic version with no nonlinear constraints on the capacity of the knapsack, known as the “knapsack problem”, is a well-known NP-hard problem.

For the “generalized stochastic knapsack”, I have investigated structural properties of the optimal strategies belonging to the class of “coordinate-convex policies” (e.g., presence of thresholds and relationships between the locations of adjacent “corner points”). Such properties allow one to restrict the search for the optimal strategies. After having studied how the number of strategies that satisfy such properties depends on the form of the nonlinear boundary of the admission region, I have analyzed how the optimal value of the objective varies as a consequence of a variation of the admission region itself. This investigation is motivated by the fact that admission regions with “simple” boundary make it easier to find the associated optimal strategies.

I have studied some criteria to find suboptimal “coordinate-convex” strategies that can be locally improved. On the basis of such criteria, I have developed a greedy algorithm for

the approximate solution of the “generalized stochastic knapsack” problem. The related simulation results have shown a significant improvement of the objective value with respect to the decisional strategies adopted in the initialization stage.

In another series of works, I have studied some models of packet forwarding in Intermittently Connected Networks (ICNs) by using queueing theory, stochastic dominance arguments, and z-transform techniques. For such models, I have formulated optimization problems, looking for a suitable trade-off between contrasting requirements, e.g., reducing the average buffer occupancy of the network nodes and the average packet delay. These are related, respectively, to the congestion of the network and to the level of QoS to be guaranteed to the users.

8) Consensus problems in multi-agent systems and distributed scheduling in cloud computing

- *Papers in refereed international journals: [IJ50, IJ56, IJ58, IJ66]*
- *Book chapters and international conference papers, with revision of the full paper: [CP21]*

In the consensus problem on multi-agent systems, in which the states of the agents are “opinions”, the agents aim at reaching a common opinion (or “consensus state”) through local exchange of information. Applications are, e.g., in sensor networks, in robotics, and in the study of social networks. An important design problem is to choose the degree of interconnection of the subsystems representing the agents so as to achieve a good trade-off between a small number of interconnections and a fast convergence to the consensus state, which is the average of the initial opinions under mild conditions. This is especially needed when each interconnection has an associated “cost of communication”. I have addressed this problem through several regularized versions of the well-known “Fastest Mixing Markov-Chain problem”. In particular, I have shown that such versions can be interpreted as “robust” forms of the Fastest Mixing Markov-Chain problem. Besides numerical examples, I have also provided theoretical results useful to guide the choice of the regularization parameter. More recently, I have studied a possible way to increase the rate of convergence to the consensus state by using a “hierarchical” approach, based on clustering and spectral graph theory.

Finally, I have applied the Alternating Direction Method of Multipliers (ADMM) to an optimization problem modeling distributed task scheduling in volunteer cloud computing, maximizing the number of scheduled tasks. Then, I have applied the same method to a different optimization problem modeling distributed task scheduling in “green” volunteer cloud computing.

9) Cooperative and noncooperative games, and their applications to economics

- *Papers in refereed international journals: [IJ7, IJ14, IJ17, IJ21, IJ24, IJ26, IJ29, IJ32, IJ40, IJ46, IJ47, IJ48, IJ51, IJ53, IJ77]*
- *Book chapters and international conference papers, with revision of the full paper: [BC2, BC7, BC9, CP7, CP13, CP14, CP15, CP18, CP22]*

In this context, I have studied the effects of ageing on the sustainability of several pension systems based on different funding methods (the pay-as-you-go and fully funded systems) and payment schemes, when the labor supply choice is endogenous. In these problems,

one is basically looking for an equilibrium in a game with an infinite number of players (each working generation, the firm, and the government). In particular, I have focused the analysis on a fully funded system with a redistributive component. In this research, my contribution has been mainly in finding equilibrium solutions in closed-form and investigating the properties of the dynamical systems describing, for each model, the evolution in equilibrium of the physical capital in efficiency units (such as existence of steady-state solutions, and their stability).

In recent years, the concept of “price of anarchy” has emerged as a tool to measure the efficiency of Nash equilibria in noncooperative games (the term “price of anarchy” originated from Computer Science applications). In this framework, I have adapted this concept to subgame-perfect Nash equilibria arising in several different dynamic noncooperative game-theoretic models for the parallel trade of pharmaceuticals, where the term “parallel trade” refers to the practice of buying products in a country where prices are lower, then re-selling them in a country where prices are higher. More specifically, for a suitable functional choice of the global welfare associated with two countries, I have found in closed form its optimal value, then I have evaluated for such expression the prices of anarchy associated with the subgame-perfect Nash equilibria of several dynamic noncooperative games modeling the strategic interaction between a manufacturer in the first country and a distributor in the second country. This analysis has also included two original models. Finally, I have evaluated the dependence of such prices of anarchy on the relative market size of the exporting country with respect to the importing one, and on the per-unit parallel trade cost. The analysis has taken into account the total fixed cost of production associated with research and development, making it possible to investigate the decision by the manufacturer whether to do or not to do research and development. Then, have also considered another model involving only one decision maker, in which, however, a more complex functional form is adopted for the objective function to be optimized. Also in this case, we have obtained optimal solutions in closed form.

In another research, I have proposed a two-player differential game model of pollution that accounts for a time-dependent environmental absorption efficiency. Such a model allows for the possibility of a switching of the biosphere from a carbon sink to a carbon source and vice-versa. I have investigated the impact of negative externalities resulting from the transboundary pollution noncooperative game wherein countries are dynamically involved. To do so, I have investigated the difference in steady state between cooperative, open-loop and Markov perfect Nash equilibria. For the latter, I have also compared three numerical methods for its approximation, i.e., a quadratic approximation, one based on the method of successive approximations, and one based on the collocation method used to solve nonlinear partial differential equations. I have personally implemented all these approximation methods in MATLAB. Moreover, in another work, I have applied similar techniques for a different model of transboundary pollution. In the ongoing work [WR3] with Fouad El Ouardighi (ESSEC Business School, Cergy Pontoise) and Marcello Sanguineti (University of Genoa), we have considered a modification of the model above, in which both producers and deforesters are present. In the ongoing work [WR4] with Francesco Biancalani (IMT - School for Advanced Studies, Lucca) and Leonardo Badia (University of Padua), we have developed a game-theoretical model of competition with green/non-green products. In another work, I have applied game theory to study a pharmaceutical price-volume agreement model involving one principal and two agents.

For what concerns machine-learning applications of game theory, I have investigated the application of tools from cooperative game theory (in particular, the Shapley value) to

estimate the importance of each individual in a team in following a particular point of interest, using motion capture data to define the features. I have also applied the Shapley value to games defined on graphs, in order to automatically detect leading nodes in a graph representation of the human body, using motion capture data. Finally, I have developed an accessible interface for the online version of a recent board game.

I have applied tools from cooperative game theory also to transport networks, studying the mathematical properties of the proposed cooperative game-theoretical models of node centrality, based on the Shapley value. I have also studied the occurrence of Braess' paradox in the proposed framework. Finally, I have applied a generalization of the Shapley value to measure the importance of single players in a basketball team, also investigating the correlation of the generalized Shapley values and salary.

10) Optimization methods for the design of innovative materials

- *Papers in refereed international journals: [IJ13, IJ15, IJ28, IJ34, IJ35, IJ38, IJ39, IJ41, IJ57, IJ61]*
- *Book chapters and international conference papers, with revision of the full paper: [LN6, LN9, CP4, CP5, CP8, CP9, CP11, CP12]*

In this field, I have designed phononic structures and studied related band gap optimization problems. In particular, I have applied convex and nonconvex optimization techniques to the design of mechanical structures based on innovative metamaterials, with potential applications, e.g., in aerospace engineering, bioengineering, and robotics. More specifically, I have applied the Globally Convergent Method of Moving Asymptotes (GCMMA) combined with both Monte Carlo and Quasi-Monte Carlo initializations, and investigated also the use, for the same purpose, of Sequential Linear Programming with an adaptive trust region. I have personally implemented in MATLAB the numerical methods used to solve the problems under investigation. Since such problems are characterized by a high computational cost for the evaluation of the objective function, I have also studied the possibility of using surrogate optimization methods to replace the initial objective function with another one, whose evaluation is less computationally expensive (such a surrogate objective function can be obtained, e.g., by applying machine learning or mesh-free function interpolation techniques, possibly exploiting smoothness properties of the objective function, which I have proved for a specific band gap optimization problem). I have also studied Floquet-Bloch generalized spectra using homogenization techniques and the Fourier modal method, and the frequency band structure of hierarchical viscoelastic metamaterials. In another research, I have applied adaptive surrogate optimization to the design of meta-filters. Finally, I have also applied optimization algorithms to the optimization of rough profiles.

In another work, I have investigated the active control of wave propagation in metamaterials Then, I have applied principal component analysis to bang gap optimization in metamaterials. Moreover, I have investigated theoretically the application of principal component analysis to the convex combination of data matrices, with particular reference to its application to the multi-objective optimization of acoustic metamaterial filters.

Summary of the scientific production

The scientific production includes

- 1 book published by Springer,
- 107 papers in international journals, and more precisely: 96 over 107 in journals indexed by ISI and Scopus, other 6 in journals indexed by Scopus only, and 1 in a journal indexed by ISI only,
- 2 editorials in international journals,
- 30 book chapters, and
- 98 international conference papers/abstracts.

161 of the publications are currently indexed by Scopus. Up to the current date, the journal papers have a total ISI Impact Factor (IF) equal to 299.6, and the publications have attracted 1531 citations according to Scopus, and 2259 according to Google Scholar. The current h-index on Scopus is 23. 44 of the journal papers are in “Class A” journals for “Area 13: Economics and Statistics”.

Post-Laurea training

Ph.D. courses at the University of Genoa

- “Stochastic Processes” (E. Sasso).
- “Calculus of Variations” (D. Percivale and T. Zolezzi).
- “Elliptic Equations and Sobolev Spaces” (M. Chicco).
- “Regularization Methods for High-Dimensional Learning” (F. Odone and L. Rosasco).

Ph.D. courses at other universities

- “A Short Course in Nonlinear Optimization” (A. Wachter, IBM TJ Watson Research NY) - University of Bologna, Italy, March 2007.
- EURO-FGI course “Game Theory with Application to Telecommunications” (V. Fragnelli) - University of Eastern Piedmont, December 10th -14th, 2007.
- “A Short Course in Convex Optimization” (K. Scheinberg, Columbia University, NY) - University of Bologna, July 2009.

International schools and workshops

- “The Analysis of Patterns” - “Ettore Majorana Center”, Erice, Italy - October 28th-November 6th, 2005.
- “Mathematical Foundations of Learning Theory - II” - Paris, École Normale Superieure, May-June 2006.
- Workshop “Complex Networks - Equilibrium and Vulnerability Analysis with Applications” (A. Nagurney, University of Massachusetts at Amherst) - University of Catania, March 10th-12th, 2008.
- “Graph Theory, Algorithms and Applications” - “Ettore Majorana Center”, Erice, Italy, September 8th-16th, 2008.
- “C.I.R.O. Summer School”, Bertinoro, Italy, June 28th-July 3rd, 2010.

Periods as visiting scientist

May 2021: visiting scientist at the University of Montpellier (working on the Galileo 2021 project “Automatic Movement Analysis Techniques for Applications in Cognitive/Motor Rehabilitation” between Italy and France).

January 2020: visiting scientist at the University of Wien, presenting two seminars, following the invitation by Prof. Immanuel Bomze, President of the Association of European Operational Research Societies.

October 2019 and January 2020: visiting scientist at the ESSEC Business School, Cergy Pontoise (working on the Galileo 2019 project “Should Forests be Restored by Polluters or Deforesters? An Approach based on Game Theory” between Italy and France).

June-July 2019: visiting scientist at the University of Cambridge, UK (teaching the graduate course “Optimization over Time and its Application to Online Machine Learning and Reinforcement Learning”).

March 2018: visiting scientist at Charles University, Prague (teaching the graduate course “Optimization over Time and its Application to Online Machine Learning”).

May 2016: visiting scientist at the University of Cambridge, UK (discussing possible joint research with Prof. Béla Bollobás on percolation applied to telecommunications networks).

October 2007: visiting scientist at the Institute of Computer Science of the Academy of Sciences of the Czech Republic, Prague (joint research with Prof. Věra Kůrková on machine learning and neural networks).

<u>Main scientific collaborations and associated research topics</u>

- Academy of Sciences of the Czech Republic, Prague, Czech Republic: Vera Kůrková (mathematical theory of neural networks).
- Birmingham City University, UK: Mohamed M. Gaber (machine learning theory and applications).
- Georgetown University, USA: Paul C. Kainen (neural networks).
- Imperial College, London, UK, and University of Trieste: Thomas Parisini (optimization applied to control systems).
- University of Montpellier: Benoît Bardy and Denis Mottet (machine learning applied to movement analysis).
- Bar-Ilan University, Ramat Gan, Israel: Konstantin Kogan (differential games), and Yuval Hadas (game theory in transportation networks).
- ESSEC Business School, Cergy-Pontoise, France: Fouad El Ouardighi (differential games).
- Katholieke Universiteit Leuven, Belgium: Johannes De Smedt (machine learning applied to finance), and Kristof De Witte (machine learning and causal inference),
- Zhejiang Normal University, China: Ming Li (mathematical theory of neural networks).
- Ozyegin University, Istanbul, Turkey: Berna Tuncay (optimization and game theory applied to economics).
- IMT - School for Advanced Studies, Lucca: Alberto Bemporad (optimization and control systems), Francesco Biancalani (machine learning and optimization applied to economics), Davide Bottari (machine learning applied to accessibility), Gustavo Cevolani (philosophical issues of machine learning), Filippo Fabiani (optimization and control systems), Pietro

Lenarda (optimization applied to graphical models), Federico Nutarelli (machine learning and optimization applied to economics), Nicola Lattanzi and Alessia Patuelli (machine learning applied to family business classification), Marco Paggi (optimization applied to civil engineering), and Massimo Riccaboni (machine learning and optimization applied to economics).
• Polytechnic University of Milan: Fabio Pammolli (optimization applied to pension systems and trade).
Catholic University of Milan: Andrea Signori (machine learning and statistics).
• University of Siena: Marco Gori and Stefano Melacci (optimization applied to machine learning theory and applications).
• University of Milan-Bicocca: Mauro Passacantando (game theory applied to transportation engineering).
• University of Catania: Fabio Raciti (machine learning).
• University of Genoa: Angelo Alessandri (optimization), Andrea Bacigalupo, Luigi Gambarotta, and Marco Lepidi (optimization applied to civil engineering), Mario Marchese (optimization applied to telecommunication systems), Antonio Camurri, Giorgio Roth, Angela Celeste Taramasso, and Gualtiero Volpe (machine learning applications), Marcello Sanguineti (optimization and machine learning), and Riccardo Zoppoli (optimization applied to control systems).
• University of Brescia: Francesca Fantoni (optimization and machine learning applied to metamaterials).
• University of Chieti-Pescara: Maria Laura De Bellis (mathematical models of metamaterials), and Maurizio Parton (machine learning applied to finance).
• University of Bergamo: Rodolfo Metulini, Silvio Vismara (machine learning and statistics).
• University of Pisa: Barbara Leporini (machine learning applied to accessibility).
• CNR (National Research Council), Genoa: Mauro Gaggero (neural networks).

<u>Scientific/organization/third mission activity</u>

- 2024: Member of the Int. Program Committee of the 14th Int. Conf. on Operations Research and Enterprise Systems (ICORES 2025), Porto, Portugal, February 23rd-25th, 2025.

- 2024: Member of the Int. Program Committee of the 21st Int. Conf. on Informatics in Control, Automation and Robotics (ICINCO 2024), Porto, Portugal, November 8th-10th, 2024.

- 2024: Member of the Int. Program Committee of the 10th Int. Conf. on machine Learning, Optimization & Data science (LOD 2024), Castiglione della Pescaia (Grosseto), Italy, September 22nd-25th, 2024.

- January 22nd, 2024: Online presentation at Game in Lab about the results of the research activities of the 2022 Game in Lab project “Increasing Accessibility of Online Board Games to Blind and Visually Impaired People via Machine Learning” (Principal Investigator: Giorgio Stefano Gnecco).

- November 1st, 2023: Presentation at Lucca Comics and Games 2023 (at the IMT Lucca Library): “Board Games, Accessibility, and Artificial Intelligence”. The presentation, given by Davide Bottari and Barbara Leporini, illustrated the results of

the research activities of the 2022 Game in Lab project “Increasing Accessibility of Online Board Games to Blind and Visually Impaired People via Machine Learning” (Principal Investigator: Giorgio Stefano Gnecco). Note: Giorgio Stefano Gnecco could not present that day due to serious health family problems.

- 2023: Member of the Int. Program Committee of the 36th Australasian Joint Conf. on Artificial Intelligence (AJCAI 2023), Perth, Australia, November 28th-December 1st, 2023.
- 2023: Member of the Int. Program Committee of Int. Biannual Conf. of the Italian SIGCHI Chapter “Crossing HCI and AI” (CHItaly 2023), Turin, Italy, September 20th-22nd, 2023.
- 2023: Member of the Int. Program Committee of the 32nd Int. Conf. on Artificial Neural Networks (ICANN 2023), Heraklion, Greece, September 26th-29th, 2023.
- 2023: Member of the Int. Program Committee of the 8th Int. Conf. on machine Learning, Optimization & Data science (LOD 2023), Grasmere, Lake District (London), UK, September 22nd-26th, 2023.
- 2023: Member of the Int. Program Committee of the 12th Int. Conf. on Operations Research and Enterprise Systems (ICORES 2023), Lisbon, Portugal, February 19th-21st, 2023.
- 2022: Member of the Int. Program Committee of the 35th Australasian Joint Conf. on Artificial Intelligence (AJCAI 2022), Perth, Australia, December 5th-8th, 2022.
- 2022: Member of the Int. Program Committee of the 8th Int. Conf. on machine Learning, Optimization & Data science (LOD 2022), Certosa di Pontignano (Siena), Italy, September 19th-22nd, 2022.
- 2022: Member of the Int. Program Committee of the 19th Int. Conf. on Informatics in Control, Automation and Robotics (ICINCO 2022), Lisbon, Portugal, July 14th-16th, 2022.
- 2022: Member of the Int. Program Committee of the 11th Int. Conf. on Operations Research and Enterprise Systems (ICORES 2022), Vienna, Austria, February 3rd-5th, 2022.
- 2022: Member of the Int. Program Committee of the 34th Australasian Joint Conf. on Artificial Intelligence (AJCAI 2021), Sydney, Australia, February 2nd-4th, 2022.
- 2021: Member of the Int. Program Committee of the 8th Int. Conf. on Mining Intelligence & Knowledge Exploration (MIKE 2021), Online, November 1st-3rd, 2021.
- April 27th and June 30th, 2022: first violinist in two concerts of the “Orchestra of the University of Pisa”, Pisa, Italy.
- 2021: Member of the Int. Technical Committee of the 2021 Int. Joint Conf. on Neural Networks (IJCNN 2021), Virtual Event, July 18th-22nd, 2021.

- 2021: Member of the Int. Program Committee of the 7th Int. Conf. on machine Learning, Optimization & Data science (LOD 2021), Grasmere, Lake District (London), UK, June 29th-July 2nd, 2021.
- 2021: Member of the Int. Program Committee of the 30th Int. Joint Conf. on Artificial Intelligence (IJCAI 2021), Montreal, Canada, August 21th-26th, 2021.
- 2021: Member of the Int. Program Committee of the 18th Int. Conf. on Informatics in Control, Automation and Robotics (ICINCO 2021), Lieusaint-Paris, France, July 6th-8th, 2021.
- 2021: Member of the Int. Program Committee of the 10th Int. Conf. on Operations Research and Enterprise Systems (ICORES 2021), Online, July 4th-6th, 2021.
- 2020: Member of the Int. Program Committee of the Workshop on Insights on Group & Team Dynamics at the 22nd ACM Int. Conf. on Multimodal Interaction (ICMI 2020), Utrecht, Netherlands, October 25th, 2020.
- 2020: Member of the Int. Technical Committee of the 2020 Int. Joint Conf. on Neural Networks (IJCNN 2020), Glasgow, UK, July 19th-24th, 2020.
- 2020: Member of the Int. Program Committee of the 29th Int. Joint Conf. on Artificial Intelligence and the 17th Pacific Rim Int. Conf. on Artificial Intelligence (IJCAI-PRICAI 2020), Yokohama, Japan, July 11th-17th, 2020.
- 2020: Member of the Int. Program Committee of the 6th Int. Conf. on machine Learning, Optimization & Data science (LOD 2020), Certosa di Pontignano (Siena), Italy, July 19th-22nd, 2020.
- 2020: Member of the Int. Program Committee of the 9th Int. Conf. on Operations Research and Enterprise Systems (ICORES 2020), Valletta, Malta, February 22nd-24th, 2020.
- 2019: Member of the Int. Program Committee of the 28th Int. Conf. on Artificial Neural Networks (ICANN 2019), Munich, Germany, September 17th-19th, 2019.
- 2019: Member of the Int. Program Committee of the 5th Int. Conf. on machine Learning, Optimization & Data science (LOD 2019), Certosa di Pontignano (Siena), Italy, September 10th-13th, 2019.
- 2019: Member of the Int. Technical Committee of the 2019 Int. Joint Conf. on Neural Networks (IJCNN 2019), InterContinental Budapest Hotel, Budapest, Hungary, July 14th-19th, 2019.
- 2019: Member of the Int. Program Committee of the 20th Int. Conf. on Engineering Applications of Neural Networks (EANN 2019), Crete Island, Greece, May 24th-26th, 2019.

- 2019: Member of the Int. Program Committee of the 15th Int. Conf. on Artificial Intelligence Applications and Innovations (AIAI 2019), Crete Island, Greece, May 24th-26th, 2019.

- 2019: Member of the Int. Program Committee of the 8th Int. Conf. on Operations Research and Enterprise Systems (ICORES 2019), Prague, Czech Republic, February 19th-21st, 2019.

- 2019: Member of the Int. Program Committee of the 4th Int. Conf. of the International Neural Network Society on Big Data and Deep Learning (INNS BDDL 2019), Sestri Levante, Italy, April 16th-18th, 2019.

- 2018: Member of the Int. Program Committee of the 4th Int. Conf. on machine Learning, Optimization, and Data science (LOD 2018), Volterra, Italy, September 13th-16th, 2018.

- 2018: Member of the Int. Program Committee of the 19th Int. Conf. on Engineering Applications of Neural Networks (EANN 2018), Bristol, UK, September 3rd-5th, 2018.

- 2018: Member of the Int. Technical Committee of the 2018 Int. Joint Conf. on Neural Networks (IJCNN 2018), Rio de Janeiro, Brazil, July 8th-13th, 2018.

- 2018: Member of the Int. Program Committee of the 14th Int. Conf. on Artificial Intelligence Applications and Innovations (AIAI 2018), Rhodes, Greece, May 25th-27th, 2018.

- 2018: Member of the Int. Program Committee of the 7th Int. Conf. on Operations Research and Enterprise Systems (ICORES 2018), Funchal, Madeira, Portugal, January 24th-26th, 2018.

- 2017: Member of the Int. Program Committee of the 3rd Int. Conf. on Machine Learning, Optimization and Big Data (MOD 2017), Volterra, Italy, September 14th-17th, 2017.

- 2017: Member of the Int. Program Committee of the 18th Int. Conf. on Engineering Applications of Neural Networks (EANN 2017), Athens, Greece, August 25th-27th, 2017.

- 2017: Member of the Int. Program Committee of the 6th Int. Conf. on Operations Research and Enterprise Systems (ICORES 2017), Porto, Portugal, February 23rd-25th, 2017.

- 2016: Member of the Int. Program Committee of the 12th IFIP Int. Conf. on Artificial Intelligence Applications and Innovations (AIAI 2016), Thessaloniki, Greece, September 16th-18th, 2016.

- 2016: Member of the Int. Program Committee of the 17th Int. Conf. on Engineering Applications of Neural Networks (EANN 2016), Robert Gordon University, Aberdeen, UK, September 2nd-5th, 2016.

- 2016: Member of the Int. Program Committee of the 5th Int. Conf. on Operations Research and Enterprise Systems (ICORES 2016), Rome, Italy, February 23rd-25th, 2016.

- 2015: Member of the Int. Program Committee of the 16th Int. Conf. on Engineering Applications of Neural Networks (EANN 2015), Island of Rhodes, Greece, September 25th-28th, 2015.

- 2015: Member of the Int. Program Committee of the 4th Int. Conf. on Operations Research and Enterprise Systems (ICORES 2015), Lisbon, Portugal, January 10th-12th, 2015.

- March 2015: official violinist at the EUROMECH Colloquium 575 - Contact Mechanics and Coupled Problems in Surface Phenomena.

- 2014: Member of the Int. Program Committee of the 16th ACM Int. Conf. on Multimedia Interaction (ICMI 2014), Orlando, Florida, USA, November 3rd-7th, 2014.

- 2014: Member of the Int. Program Committee of the 3rd Int. Conf. on Operations Research and Enterprise Systems (ICORES 2014), ESEO, Angers, Loire Valley, France, March 6th-8th, 2014.

- 2014: Member of the Int. Program Committee of the 24th Int. Conf. on Artificial Neural Networks (ICANN 2014), Hamburg, Germany, September 15th-19th, 2014.

- 2014: Member of the Int. Program Committee of the 2014 Int. Joint Conf. on Neural Networks (IJCNN 2014), Beijing International Convention Center, Beijing, China, July 6th-11th, 2014.

- 2014: Member of the Int. Program Committee of the 15th Int. Conf. on Engineering Applications of Neural Networks (EANN 2014), Sofia, Bulgary, September 5th-7th, 2014.

- 2013: Member of the Int. Program Committee of the 14th Int. Conf. on Engineering Applications of Neural Networks (EANN 2013), Halkidiki, Greece, September 13th-16th, 2013.

- 2012: Member of the Int. Program Committee of the 13th Int. Conf. on Engineering Applications of Neural Networks (EANN 2012), London, UK, September 20th-23rd, 2012.

- 2011: Member of the Int. Program Committee of the 12th Int. Conf. on Engineering Applications of Neural Networks (EANN 2011), Corfu, Greece, September 15th-18th, 2011.

- 2010: Member of the Int. Program Committee of the 20th Int. Conf. on Artificial Neural Networks (ICANN 2010), Thessaloniki, Greece, September 15th-18th, 2010.

- From 2009: participation as a violinist/violist to several concerts in the context of the musical activities of the University of Genoa.

- 2009: participation as a violinist /violist to the Festival of Science, Genoa.

- 2008: Scientific Secretary of the Local Organizing Committee of the 7th Int. Conf. "Mathematical Problems in Engineering, Aerospace, and Sciences" (ICNPAA 2008), Genoa.

- June 2008: official violinist at the 7th Int. Conf. "Mathematical Problems in Engineering, Aerospace and Sciences", ICNPAA 2008, Genoa.

- September 2007: official violinist at the 38th Conf. of the Italian Association of Operations Research (AIRO 2007), Genoa.

Organization and presentation of seminars at IMT

- March 1st, 2023: Antonio Villanacci, "*Opportunity-Based Other Regarding Preferences in General Equilibrium",* AXES Seminar Series, IMT - School for Advanced Studies, Lucca, Italy.

- January 18th, 2023: Giovanna D'Inverno, "*Two-Stage Stochastic Standard Quadratic Optimization",* AXES Seminar Series, IMT - School for Advanced Studies, Lucca, Italy.

- May 4th, 2022: Immanuel Bomze, "*Impact Evaluation in a Multi-Input Multi-Output Setting: Evidence on the Effect of Additional Resources for Schools",* AXES Seminar Series, IMT - School for Advanced Studies, Lucca, Italy.

- December 18th, 2020: Sara Landi, Giorgio Stefano Gnecco, and Massimo Riccaboni, "*Can Machines Learn Creativity Needs in Different Occupations?",* Workshop on Technology and the Labour Market, IMT - School for Advanced Studies, Lucca, Italy.

- November 19th-20th, 2018: Organization of the 2nd IMT Research Symposium, Lucca, Italy (with Gustavo Cevolani, Gabriele Costa, Francesco Serti): several presentations/posters from Assistant Professors, Post-Docs and Ph.D. students at IMT.

- November 19th, 2018: Andrea Bacigalupo and Giorgio Stefano Gnecco, "*Machine-learning Techniques for the Design of Innovative and Smart Materials",* 2nd IMT Research Symposium, Lucca, Italy.

- July 11th, 2018: Andrea Bacigalupo and Giorgio Stefano Gnecco, "*Metamaterial Filter Design via Surrogate Optimization"* (poster presentation), 1st IMT Research Symposium, Lucca, Italy.

- September 29th, 2017: Giorgio Stefano Gnecco, "*An Application of Game Theory to a Dice Game"* (poster presentation), Bright 2017 - Tuscany Researchers' Night 2017, Lucca, Italy.

- July 5th, 2017, Paul C. Kainen, Department of Mathematics and Statistics, Georgetown University, Washington. Title: "*Graph Bases and Diagram Commutativity*".

- July 18th, 2016: Věra Kůrkova, Institute of Computer Science, Academy of Sciences of the Czech Republic. Title: "*Convolutional Kernels for Function Approximation and Generalization in Learning from Data*".

- July 18th, 2016, Paul C. Kainen, Department of Mathematics and Statistics, Georgetown University, Washington. Title: "*Size and Covering Numbers of Graphs*".

- October 14th, 2015: Věra Kůrkova, Institute of Computer Science, Academy of Sciences of the Czech Republic. Title: "*Limitation of Capabilities of Shallow Networks*".

- March 2nd, 2015: Věra Kůrkova, Institute of Computer Science, Academy of Sciences of the Czech Republic. Title: "*Some Comparisons of Radial-Basis-Function and Kernel Networks*".

- July 10th, 2014, Paul C. Kainen, Department of Mathematics and Statistics, Georgetown University, Washington. Title: "*An Alternative Approach to Solving Problems by Multilayer Neural Network*s".

- July 10th, 2014: Věra Kůrkova, Institute of Computer Science, Academy of Sciences of the Czech Republic. Title: "*Tractability of Representations of Boolean Functions by Shallow and Deep Networks*".

- July 9th, 2014: Giorgio Stefano Gnecco, "*Optimality Conditions for a Nonlinear Stochastic Knapsack Problem*".

Reviewer activity

Reviewer for international journals

•Theoretical Computer Science (2 papers).
•Symmetry (1 paper).
•SoftwareX (2 papers).
•Soft Computing (7 papers).
•SN Computer Science (1 paper).
•SIAM Journal on Optimization (1 paper).
•PLOS ONE (3 papers).
•Pattern Recognition Letters (2 papers).
•Optimization Letters (6 papers).
•Optik - International Journal for Light and Electron Optics (2 papers).
•Operations Research Forum (4 papers).
•Neurocomputing (29 papers).
•Neural Processing Letters (32 papers).
•Neural Networks (32 papers).
•Neural Computing & Applications (6 papers).
•Neural Computation (2 papers).
•Networks (1 paper).
•Nature Human Behaviour (1 paper).
•Materials & Design (3 papers).
•Knowledge-Based Systems (3 papers).
•Journal of Sports Sciences (2 papers).

•Journal of Optimization Theory and Applications (1 paper).
•Journal of Approximation Theory (2 papers).
•Italian Journal of Applied Statistics (2 papers).
•International Journal of Mechanical Sciences (2 papers).
•International Journal of Information Technology & Decision Making (2 papers).
•International Journal of Human-Computer Studies (1 paper).
•International Journal of Computer Mathematics (1 paper).
•International Journal of Antennas and Propagation (2 papers).
•Intelligenza Artificiale (2 papers).
•Intelligent Service Robotics (1 paper).
•Intelligent Systems in Accounting, Finance and Management (1 paper).
•IET Image Processing (1 paper).
•IEEE Transactions on Vehicular Technology (2 papers).
•IEEE Transactions on Neural Networks and Learning Systems, formerly IEEE Transactions on Neural Networks (78 papers).
•IEEE Transactions on Intelligent Transportation Systems (3 papers).
•IEEE Transactions on Automatic Control (6 papers).
•IEEE Systems Journal (5 papers).
•IEEE Journal of Biomedical and Health Informatics (1 paper).
•IEEE Control Systems Letters (3 papers).
•IEEE Communications Letters (3 papers).
•Frontiers in Psychology (2 papers).
•Expert Systems with Applications (3 papers).
•European Journal of Operational Research (3 papers).
•Environmental Modelling & Software (4 papers).
•Engineering Applications of Artificial Intelligence (9 papers).
•Dynamic Games and Applications (1 paper).
•Computational Management Science (1 paper).
•Computational Intelligence and Neuroscience (1 paper).
•Computational Economics (4 papers).
•Composite Structures (2 papers).
•Central European Journal of Mathematics (1 paper).
•Bulletin of the Hellenic Mathematical Society (2 papers).
•Automatica (3 papers).
•Artificial Intelligence (1 paper).
•Applied Mathematical Sciences (15 papers).
•Applied Acoustics (2 papers).
•Annals of Operations Research (2 papers).
•ACM Transactions on the Web (1 paper).

Reviewer for international conferences

•Int. Conf. on Adaptive and Natural Computing Algorithms, 2007 (1 paper).
•47th IEEE Conf. on Decision and Control, 2008 (1 paper).
•Int. Conf. on Artificial Neural Networks, 2008 (1 paper).
•Int. Conf. on Artificial Neural Networks, 2009 (10 papers).
•48th IEEE Conf. on Decision and Control, 2009 (1 paper).
•49th IEEE Conf. on Decision and Control, 2010 (1 paper).
•Int. Conf. on Artificial Neural Networks, 2010 (5 papers).
•Int. Conf. on Informatics in Control, Automation and Robotics, 2011 (2 papers).

•50th IEEE Conf. on Decision and Control and European Control Conf., 2011 (1 paper).
•12th Int. Conf. on Engineering Applications of Neural Networks, 2011 (3 papers).
•13th Int. Conf. on Engineering Applications of Neural Networks, 2012 (2 papers).
•51st IEEE Conf. on Decision and Control and European Control Conf., 2012 (2 papers).
•2013 IEEE American Control Conf. (2 papers).
•52nd IEEE Conf. on Decision and Control and European Control Conf., 2013 (2 papers).
•Int. Conf. on Artificial Neural Networks, 2013 (4 papers).
•14th Int. Conf. on Engineering Applications of Neural Networks, 2013 (1 paper).
•6th Int. Conf. of Students of Systematic Musicology, 2013 (3 papers).
•15th ACM Int. Conf. on Multimedia Interaction, 2013 (2 papers).
•3rd Int. Conf. on Operations Research and Enterprise Systems, 2014 (5 papers).
•13th IEEE European Control Conference, 2014 (1 paper).
•Int. Joint Conf. on Neural Networks, 2014 (4 papers).
•Int. Conf. on Artificial Neural Networks, 2014 (3 papers).
•15th Int. Conf. on Engineering Applications of Neural Networks, 2014 (3 papers).
•4th Int. Conf. on Operations Research and Enterprise Systems, 2015 (6 papers).
•Int. Joint Conf. on Neural Networks, 2015 (2 papers).
•16th Int. Conf. on Engineering Applications of Neural Networks, 2015 (2 papers).
•5th Int. Conf. on Operations Research and Enterprise Systems, 2016 (2 papers).
•Int. Joint Conf. on Neural Networks, 2016 (2 papers).
•55th IEEE Conf. on Decision and Control and European Control Conf., 2016 (2 papers).
•12th Int. Conf. on Artificial Intelligence Applications and Innovations, 2016 (2 papers).
•6th Int. Conf. on Operations Research and Enterprise Systems, 2017 (1 paper).
•Int. Joint Conf. on Neural Networks, 2017 (4 papers).
•Int. Conf. on Optimization and Decision Science, 47th Conf. of the Italian Operational Research Society, 2017 (2 papers).
•Int. Conf. on Artificial Neural Networks, 2017 (2 papers).
•18th Int. Conf. on Engineering Applications of Neural Networks, 2017 (1 paper).
•3rd Int. Conf. on Machine learning, Optimization and big Data, 2017 (2 papers).
•7th Int. Conf. on Operations Research and Enterprise Systems, 2018 (1 paper).
•5th Int. Conf. on Movement and Computing, 2018 (4 papers).
•4th Int. Conf. on machine Learning, Optimization, and Data science, 2018 (3 papers).
•3rd IEEE Int. Conf. on Robotic Computing, 2019 (2 papers).
•8th Int. Conf. on Operations Research and Enterprise Systems, 2019 (2 papers).
•4th Int. Conf. of the International Neural Network Society on Big Data and Deep Learning, 2019 (1 paper).
•Int. Joint Conf. on Neural Networks, 2019 (6 papers).
•15th Int. Conf. on Artificial Intelligence Applications and Innovations, 2019 (1 paper).
•Int. Conf. on Artificial Neural Networks, 2019 (4 papers).
•5th Int. Conf. on machine Learning, Optimization, and Data science, 2019 (2 papers).
•Int. Conf. on Optimization and Decision Science, 49th Conf. of the Italian Operational Research Society, 2019 (6 papers).
•European Control Conf., 2019 (1 paper).
•9th Int. Conf. on Operations Research and Enterprise Systems, 2020 (2 papers).
•29th Int. Joint Conf. on Artificial Intelligence and 17th Pacific Rim Int. Conf. on Artificial Intelligence, 2020 (2 papers).
•Int. Joint Conf. on Neural Networks, 2020 (5 papers).

•6th Int. Conf. on machine Learning, Optimization, and Data science, 2020 (2 papers).
•Workshop on Insights on Group & Team Dynamics at the 22nd ACM Int. Conf. on Multimodal Interaction, 2020 (1 paper).
•European Control Conf., 2020 (1 paper).
•Int. Joint Conf. on Neural Networks, 2020 (6 papers).
•2nd Int. Conf. on Nonlinear Dynamics, 2021 (2 papers).
•10th Int. Conf. on Operations Research and Enterprise Systems, 2021 (2 papers).
•30th Int. Joint Conf. on Artificial Intelligence, 2021 (3 papers).
•18th Int. Conf. on Informatics in Control, Automation and Robotics, 2021 (2 papers).
•7th Int. Conf. on machine Learning, Optimization, and Data science, 2021 (2 papers).
•34th Australasian Joint Conf. on Artificial Intelligence, 2021 (5 papers).
•8th Int. Conf. on Mining Intelligence & Knowledge Exploration, 2021 (2 papers).
•2022 IEEE American Control Conf. (1 paper).
•11th Int. Conf. on Operations Research and Enterprise Systems, 2022 (2 papers).
•Int. Joint Conf. on Neural Networks, 2022 (7 papers).
•19th Int. Conf. on Informatics in Control, Automation and Robotics, 2022 (1 paper).
•8th Int. Conf. on machine Learning, Optimization, and Data science, 2022 (2 papers).
•35th Australasian Joint Conf. on Artificial Intelligence, 2022 (3 papers).
•12th Int. Conf. on Operations Research and Enterprise Systems, 2022 (2 papers).
•European Control Conf., 2023 (1 paper).
•Int. Conf. on Artificial Neural Networks, 2023 (3 papers).
•9th Int. Conf. on machine Learning, Optimization, and Data science, 2023 (2 papers).
•Int. Biannual Conf. of the Italian SIGCHI Chapter “Crossing HCI and AI”, 2023 (2 papers).
•36th Australasian Joint Conf. on Artificial Intelligence, 2023 (4 papers).
•9th Int. Conf. on Movement and Computing, 2024 (5 papers).
•17th Int. Conf. on Advanced Visual Interfaces, 2024 (1 paper).
•Int. Conf. on Optimization and Decision Science, 54th Conf. of the Italian Operational Research Society, 2024 (2 papers).
•Int. Conf. on Sound and Music Computing, 2024 (5 papers).
•10th Int. Conf. on machine Learning, Optimization, and Data science, 2024 (4 papers).
•21st Int. Conf. on Informatics in Control, Automation and Robotics, 2024 (1 paper).

Reviewer for monographs

•“Complex-Valued Neural Networks: Utilizing High-Dimensional Parameters”, T. Nitta, Ed. (Publisher: Medical Information Science Reference), 2009 (review performed in 2008, before the publication of the book).

Reviewer for Zentralblatt MATH of published books and papers

•M. Ye, T. K. Pong, “*A Subgradient-based Approach for Finding the Maximum Feasible Subsystem with Respect to a Set*”, **SIAM Journal on Optimization**, vol. 30, pp. 1274-1299, 2020 (review performed in 2021).
•I. Bajaj, M. M. F. Hasan, “*Global Dynamic Optimization Using Edge-Concave Underestimator*”, **Journal of Global Optimization**, vol. 77, pp. 487-512, 2020 (review performed in 2021).
•M. J. Kim, “*Variance Regularization in Sequential Bayesian Optimization*”, **Mathematics of Operations Research**, vol. 45, pp. 966-992, 2020 (review performed in 2021).

•M. C. Robini, F. Yang, Y. Zhu, "*A Stochastic Approach to Full Inverse Treatment Planning for Charged-Particle Therapy*", **Journal of Global Optimization**, vol. 77, pp. 753-893, 2020 (review performed in 2020).
•W. Cheng, Z. Chen, Q. Hu, "*An Active Set Barzilar-Borwein Algorithm for L_0 Regularized Optimization*", **Journal of Global Optimization**, vol. 76, pp. 769-791, 2020 (review performed in 2020).
•D. P. Bertsekas, "Abstract Dynamic Programming", Athena Scientific, 2013 (review performed in 2015).
•N. Halman, D. Klabjan, C.-L. Li, J. Orlin, D. Simchi-Levi, "*Fully Polynomial Time Approximation Schemes for Stochastic Dynamic Programs*", **SIAM Journal on Discrete Mathematics**, vol. 28, pp. 1725-1796, 2014 (review performed in 2015).

Reviewer for national and international projects

•Research project SKAT-VG (Sketching Audio Technologies using Vocalizations and Gestures), funded by the European Commission within FP7–ICT–FET schema (three review meetings: January 2015 in Venice, Italy, October 2015 in Lisbon, Portugal, and January 2017 in Paris, France).

•From 2015: reviewer for international projects (calls from FP7–ICT–FET, Game in Lab, and the Swiss Data Science Center) and national projects (calls from ARTES 4.0, FAR 2018, and Fondazione di Sardegna).

Reviewer for the Italian National Evaluation of Research Quality (VQR)

•VQR 2015-2019: evaluator of 7 published scientific journal articles in the following three disciplines: Computer Science (INF/01), Mathematical Methods of Economics and of Actuarial and Financial Sciences (SECS-S/06), Operations Research (MAT/09).

Invited talks

- October 16th, 2024 (scheduled): invited talk at the Department of Economics of the University of Bergamo (Statistics Seminar Series): "*Approximating the Shapley Value in Transportation Network Cooperative Games*" (with Y. Hudas, M. Passacantando, M. Sanguineti). Organizer: Tommaso Lando.

- November 30th, 2021: invited talk at the tenth Italian Workshop on Machine Learning and Data Mining, Online: "*On Automatic Dispersion Curve Identification for Metamaterials*" (with A. Bacigalupo, F. Nutarelli, D. Selvi). Organizers: Alessio Micheli and Claudio Gallicchio.

- November 30th, 2021: invited talk at the tenth Italian Workshop on Machine Learning and Data Mining, Online: "*Combining Machine Learning and Mathematical Games for the Automated Analysis of Movement*" (with M. Sanguineti, A. Camurri, B. Bardy, D. Mottet). Speaker: Marcello Sanguineti. Organizers: Alessio Micheli and Claudio Gallicchio.

- January 13th, 2020: invited talk at the Department of Statistics and Operations Research of the University of Wien (series of seminars on Advanced Optimization):

"*Surrogate Optimization and Other Machine Learning Techniques for the Design of Smart Metamaterials*" (with A. Bacigalupo, M. Lepidi, and L. Gambarotta). Organizer: Immanuel Bomze.

- January 13th, 2020: invited talk at the Department of Statistics and Operations Research of the University of Wien (series of seminars: ISOR Kolloquium): "*On the Optimal Trade-off between Sample Size and Precision of Supervision in Regression*" (with F. Nutarelli). Organizer: Immanuel Bomze.

- July 1st and 2nd, 2019: invited talk at the Centre for Mathematical Sciences of the University of Cambridge, UK: "*Shapley Value for Cooperative Games on Graphs*". Organizer: Béla Bollobás.

- November 22nd, 2018: invited talk at the seventh Italian Workshop on Machine Learning and Data Mining, University of Trento, Italy: "*Machine-Learning Techniques for the Design of Innovative and Smart Materials*" (with A. Bacigalupo). Organizers: Alessio Micheli and Claudio Gallicchio.

- March 5th, 2018: invited talk at the Institute of Computer Science - Academy of Sciences, Prague, Czech Republic: "*Introduction to Sparse Regression through the LASSO*". Organizer: Martin Holeňa.

- November 28th, 2016: invited talk at the fifth Italian Workshop on Machine Learning and Data Mining, University of Genoa, Italy: "*A Constrained Machine-Learning Paradigm with Hard and Soft Constraints*" (with M. Gori, S. Melacci, and M. Sanguineti). Organizers: Alessio Micheli and Claudio Gallicchio.

- February 16th, 2016: invited talk at Scuola Superiore Sant'Anna, Pisa, Italy: "*A Two-Player Differential Game Model of Transboundary Pollution Control with a Time-Dependent Environmental Absorption Efficiency*" (with F. El Ouardighi, K. Kogan, and M. Sanguineti). Organizer: Pietro Battiston.

- September 22nd, 2015: invited talk at the fourth Italian Workshop on Machine Learning and Data Mining, University of Ferrara, Italy: "*A Model of Online Learning as a Linear Quadratic Gaussian (LQG) Optimal Control Problem with Random Matrices*" (with A. Bemporad, M. Gori, R. Morisi, and M. Sanguineti). Organizers: Alessio Micheli and Giorgio Valentini.

- May 7th, 2015: invited talk at the Workshop on "Variational Analysis, Game Theory and Related Topics", University of Genoa, Italy: "*A Two-Player Differential Game Model for Transboundary Pollution Control and Environmental Absorption Efficiency Management*" (with F. El Ouardighi, K. Kogan, and M. Sanguineti). Organizers: Monica Bianchini, Massimo Pappalardo, Rita Pini, and Lucia Pusillo.

- December 10th, 2014: invited talk at the third Italian Workshop on Machine Learning and Data Mining, University of Pisa, Italy: "*Learning with Mixed Hard/Soft Constraints by Support Constraint Machines*" (with M. Gori, S. Melacci, and M. Sanguineti). Organizers: Nicola Di Mauro, Paolo Frasconi, and Alessio Micheli.

- May 8th, 2012: invited talk at the research center "Casa Paganini - Infomus", University of Genoa, Italy: "*Evaluating Leadership in Music Ensemble Performance*

via Measures of Network Centrality, Game Theory, and Optimal Control on Networks" (with M. Sanguineti). Organizer: Antonio Camurri.

- February 21st, 2012: invited talk at the seminar "Optimization and Game Theory", DIMA, University of Genoa, Italy: "*N-Stage Optimization via Approximations of the Policy Functions*" (with M. Gaggero and M. Sanguineti). Organizers: Lucia Pusillo and Tullio Zolezzi.

- October 7th, 2009: invited talk at the seminar SLIPGURU - DISI, University of Genoa, Italy: "*Approximation Bounds via Rademacher's Complexity*" (with M. Sanguineti). Organizer: Alessandro Verri.

- October 22nd, 2007: invited talk at the Institute of Computer Science - Academy of Sciences, Prague, Czech Republic: "*Neural Network Approximation Error Bounds in terms of Rademacher's Complexity*" (with M. Sanguineti). Organizer: Věra Kůrkova.

Participation at international conferences as general/panel/session chair/organizer of invited sessions

- Member of the scientific and organizing committee of the Workshop "Machine Learning for Data & Algorithm-Sharing in Social Science" (**ML DAS 2024**), Lucca, Italy, May 27th-28th, 2024.

- General chair of the 14th EAI Int. Conf. on Intelligent Technologies for Interactive Entertainment (**EAI INTETAIN 2023**), Lucca, Italy, November 27th, 2023.

- 2022: Member of the Organizing Committee of the Conf. "Digitalization and Intelligent Technologies for Corporate Governance. The Contribution of Business Economics to the Country System (**SIDREA 2022**)", Lucca, Italy, October 20th-21st, 2022.

- Organizer and session chair of an invited session on "Machine learning-based optimization for extreme metamaterials design" (with Andrea Bacigalupo and Francesca Fantoni) at the Int. Conf. on Optimization and Decision Science (**ODS 2022**), Florence, Italy, August 30th-September 2nd, 2022.

- Organizer of an invited session on "Machine Learning and Causal Inference with Economic Applications" (with Falco J. Bargagli Stoffi, Kristof De Witte, Marco Gori, and Massimo Riccaboni) at the 8th International Online & Onsite Conference on Machine Learning, Optimization, and Data Science (**LOD 2022**), Certosa di Pontignano (Siena), Italy, September 19th-22nd, 2022.

- Organizer of an invited session on "Recent Advances in Deep Learning for Graphs" (with Federico Errica, Ming Li, Alessio Micheli, Marcello Sanguineti, and Franco Scarselli) at the 8th International Online & Onsite Conference on Machine Learning, Optimization, and Data Science (**LOD 2022**), Certosa di Pontignano (Siena), Italy, September 19th-22nd, 2022.

- Organizer of an invited session on "Deep Neural Nets with Randomized Learning Techniques" (with Ming Li and Marcello Sanguineti) at the 34th Australasian Joint

Conf. on Artificial Intelligence (**AJCAI 2021**), Sydney, Australia, February 2nd-4th, 2022.

- Organizer of an invited session on "Networks Performance and Reliability" (with Mauro Passacantando and Marcello Sanguineti) at the Int. Conf. on Optimization and Decision Science (**ODS 2021**), Rome, Italy, September 14th-17th, 2021.

- Organizer and session chair of an invited session on "Machine Learning-based Optimization and Control for Extreme Metamaterials" (with Andrea Bacigalupo and Daniela Selvi) at the Int. Conf. on Optimization and Decision Science (**ODS 2021**), Rome, Italy, September 14th-17th, 2021.

- Organizer and session chair of an invited session on "Multiscale Optimal Design of Architected Materials and Smart Metamaterials via Machine Learning Techniques" (with Andrea Bacigalupo, Emanuela Bosco, and Francesca Fantoni) at the Int. Conf. on Metamaterials and Nanophotonics (**METANANO 2021**), Tbilisi, Georgia, September 13th-17th, 2021.

- Session chair at the International Conference on Optimization and Decision Science (**ODS 2020**), Online, November 19th, 2020.

- Organizer of an invited session on "Transportation Networks Performance and Reliability" at the Int. Conf. on Optimization and Decision Science (**ODS 2019**), Genoa, Italy, September 4th-7th, 2019.

- Panel chair within the Program Committee of the 4th International Conference of the International Neural Network Society on Big Data and Deep Learning (**INNS BDDL 2019**), Sestri Levante, Italy, April 16th-18th, 2019.

- Session chair within the Program Committee of the 4th International Conference of the International Neural Network Society on Big Data and Deep Learning (**INNS BDDL 2019**), Sestri Levante, Italy, April 16th-18th, 2019.

- Session chair at the 20th Conference of the International Federation of Operational Research Societies (**IFORS 2014**), p. 196, Barcelona, Spain, July 13rd-18th, 2014.

Participation at international conferences as speaker

- EAI INTETAIN 2023, Lucca, Italy, November 27th, 2023.
- LOD 2022, Certosa di Pontignano, Italy, September 18th-22nd, 2022.
- ODS 2022, Florence, Italy, August 30th-September 2nd, 2022.
- ESEE 2022, Pisa, Italy, June 14th-17th, 2022.
- Workshop "Philosophy of Science Meets Machine Learning", Tübingen, Germany, November 9th-12th, 2021.
- LOD 2021, Grasmere, UK, October 4th-8th, 2021.
- METANANO 2021, Tbilisi, Georgia, September 13th-18th, 2021.
- ODS 2021, Rome, Italy, September 14th-17th, 2021.
- ODS 2020, Online, November 19th, 2020.
- METANANO 2020, Tbilisi, Georgia, September 14th-18th, 2020.

- LOD 2020, Certosa di Pontignano, Italy, September 19th-23rd, 2020.
- AIMETA 2019, Rome, Italy, September 15th-19th, 2019.
- AMASES 2019, Perugia, Italy, September 9th-11th, 2019.
- ODS 2019, Genoa, Italy, September 4th-7th, 2019.
- INNS BDDL 2019, Sestri Levante, Italy, April 16th-18th, 2019.
- METANANO 2018, Sochi, Russia, September 17th-21st, 2018.
- ODS 2018, Taormina, Italy, September 10th-13th, 2018.
- EURO 2018, Valencia, Spain, July 8th-11th, 2018.
- AIMETA 2017, Salerno, Italy, September 4th-7th, 2017.
- ODS 2017, Sorrento, Italy, September 4th-7th, 2017.
- MOD 2016, Volterra, Italy, August 26th-29th, 2016.
- ESANN 2016, Bruges, Belgium, September 27th-29th, 2016.
- AIRO 2015, Pisa, Italy, September 7th-10th, 2015.
- IEEE ECC 2015, Linz, Austria, July 15th-17th, 2015.
- IEEE CDC 2014, Los Angeles, CA, USA, December 15th-17th, 2014.
- AIRO 2014, Como, Italy, September 2nd-5th, 2014.
- IFORS 2014, Barcelona, Spain, July 13rd-18th, 2014.
- ArtsIT 2013, Milan, Italy, March 21st-23rd, 2013.
- AIRO Winter 2011, Cortina d'Ampezzo, Italy, February 7th-12th, 2011.
- EURO 2010, Lisbon, Portugal, July 11th-14th, 2010.
- SOFSEM 2010, Špindlerův Mlýn, Czech Republic, January 23rd-29th, 2010.
- INOC 2009, Pisa, Italy, April 26th-29th, 2009.
- AIRO 2009, Siena, Italy, September 8th-11th, 2009.
- AIRO 2007, Genoa, Italy, September 5th-8th, 2007.

Editorial activity

Since February 2023: Associate Editor for the international journal “Soft Computing” (indexed in ISI and Scopus). According to the ISI Impact Factor 2023, the journal is in the second quartile in ISI for 2 different subject categories.

Since February 2022: Member of the Early Assessment Committee and Associate Editor for the international journal “IEEE Transactions on Neural Networks and Learning Systems” (indexed in ISI and Scopus). According to the ISI Impact Factor 2023, the journal is in the first quartile in ISI for 4 different subject categories.

Since August 2021: Associate Editor for the international journal “Neurocomputing” (indexed in ISI and Scopus). According to the ISI Impact Factor 2023, the journal is in the first quartile in ISI for 1 subject category.

2020-2022: Guest Editor of the Special Issue “Deep Neural Networks for Graphs: Theory, Models, Algorithms and Applications” in the international journal “IEEE Transactions on Neural Networks and Learning Systems” (indexed in ISI and Scopus). According to the ISI Impact Factor 2023, the journal is in the first quartile in ISI for 4 different subject categories.

Since January 2020: Action Editor for the international journal “Neural Networks” (indexed in ISI and Scopus). According to the ISI Impact Factor 2023, the journal is in the first quartile in ISI for 2 different subject categories.

From January 2013 to December 2019: Associate Editor for the international journal “IEEE Transactions on Neural Networks and Learning Systems” (indexed in ISI and Scopus). According to the ISI Impact Factor 2023, the journal is in the first quartile in ISI for 4 different subject categories.

From 2011 to 2016: Associate Editor for the international journal “Mathematics in Engineering, Science and Aerospace” (indexed in Scopus).

2009: Guest Editor of the Special Issue “Mathematical Problems in Engineering” in the international journal “Applied Mathematical Sciences” (indexed in Scopus).

Participation in international research projects

- 2024: member of the “Research in Pairs” research project “Theoretical Studies on the Generalization Capability of Deep Graph Convolutional Networks”, granted by ICTP (International Centre for Theoretical Physics) and INdAM (Italian National Institute for High Mathematics) between Italy and China (Chinese Responsible: Prof. Ming Li from Zhejiang Normal University).

- From 2022 to 2023: Principal Investigator of the “Game in Lab 2022” research project “Increasing Accessibility of Online Board Games to Blind and Visually Impaired People via Machine Learning”, granted by Game in Lab. Amount: 15000 Euros.

- From 2021 to 2023: Italian Responsible of the “Galileo 2021” research project “Automatic Movement Analysis Techniques for Applications in Cognitive/Motor Rehabilitation” between Italy and France (French Responsible: Prof. Denis Mottet from the University of Montpellier). Amount: 6700 Euros (Italian side).

- From 2020 to 2021: Italian Responsible of the “Research in Pairs” research project “On the Expressive Power of Neural Nets with Random Weights”, granted by ICTP (International Centre for Theoretical Physics) and INdAM (Italian National Institute for High Mathematics) between Italy and China (Chinese Responsible: Prof. Ming Li from Zhejiang Normal University). Amount: 1300 Euros. Note: no use of the funds was possible, to the Covid-19 pandemic, which prevented traveling from China to Italy and vice-versa. Nevertheless, the project took place regularly with Skype meetings and e-mail exchanges, and produced the joint publication [LN5].

- From 2019 to 2021: Italian Responsible of the “Galileo 2019” research project “Should Forests be Restored by Polluters or Deforesters? An Approach based on Game Theory” between Italy and France (French Responsible: Prof. Fouad El Ouardighi from ESSEC Business School). Amount: 5760 Euros (Italian side).

- From 2018 to 2019: member of the EU research project 2016-2018 H2020 ICT TELMI (Technology Enhanced Learning of Musical Instrument performance: http://telmi.upf.edu). Italian Coordinator: Prof. Gualtiero Volpe.

- From 2016 to 2018: member of the Advisory Board of the EU research project 2015-2017 H2020 ICT DANCE (Dancing in the dark: http://dance.dibris.unige.it). Italian Coordinator: Prof. Antonio Camurri.

- From 2015 to 2017: member of the EU research project 2015-2017 H2020 SPIRE DISIRE (Integrated Process Control based on Distributed In-Situ Sensors into Raw Material and Energy Feedstock: http://www.spire2030.eu/disire). Italian Coordinator: Prof. Alberto Bemporad.

- From September 2013 to December 2014: member of the EU research project 2012-2014 H2020 ICT EFFINET (Efficient Integrated Real-time Monitoring and Control of Drinking Water Networks: effinet.eu). Italian Coordinator: Prof. Alberto Bemporad.

- January 2012-June 2013: member of the DIBRIS research staff (University of Genoa) in the EU research project 7FP ICT FET SIEMPRE (Social Interaction and Entrainment using Music PeRformancE: www.siempre.infomus.org). Coordinator: Prof. Antonio Camurri. In the project, I contributed in the investigation of techniques for the automated analysis of nonverbal social signals in groups of people. I also applied my competencies in music, combining them with methods of Machine Learning and Operations Research (e.g., Game Theory).

- Member of the international research project 2010-2012 "Complexity of Neural-Network and Kernel Computational Models", among University of Genoa, National Research Council of Italy, and Czech Academy of Sciences. Italian Coordinator: Prof. Marcello Sanguineti. Czech Coordinator: Prof. Věra Kůrkova.

- September 2007-2009: member of the international research project 2004-2009 "Learning from Data by Neural Networks and Kernel Methods: An Approach Based on Approximate Optimization" (originally a 2004-2006 project, then renewed for the years 2007-2009), among University of Genoa, National Research Council of Italy, and Czech Academy of Sciences. Italian Coordinator: Prof. Marcello Sanguineti. Czech Coordinator: Prof. Věra Kůrkova.

Participation in national (Italian) research projects

- 2024: member of the research project "Variational Inequality Approach to Network Games", granted by INdAM-GNAMPA (Italian National Institute for High Mathematics, National Group for Mathematical Analysis, Probability, and their Applications). Coordinator: Prof. Fabio Raciti.

- From 2023: Project Responsible of the "Regional Call for Research Grants 2023" research project "ROBOFARM – Development of Edge Computing Tools for Robotic Platforms in the Context of Precision Agriculture", granted by Tuscany Region. Amount: 48000 Euros. Partner of the project: Sigma Ingegneria.

- From 2023: Principal Investigator of the "PRIN PNRR 2022" research project "MOTUS – Automated Analysis and Prediction of Human Movement Qualities", granted by MUR. Amount: 88093 Euros (IMT side).

- From 2023: Unit Responsible and Substitute Principal Investigator of the "PRIN 2022" research project "MAHATMA – Multiscale Analysis of Human and Artificial

Trajectories: Models and Applications", granted by MUR. Amount: 64010 Euros (IMT side).

- 2023-2024: Coordinator of the INdAM-GNAMPA 2023 research project "Development of Machine-Learning Methods for the Estimation of the Shapley Value and of its Generalizations", granted by INdAM-GNAMPA (Italian National Institute for High Mathematics, National Group for Mathematical Analysis, Probability, and their Applications). Amount: 2500 Euros.

- From 2022: member of the European "Horizon-Mission-Cancer" research project "MammoScreen". Coordinator of the research project: Gianni D'Errico (Toscana Life Sciences). Coordinator of the IMT Research Unit of the research project: Prof. Massimo Riccaboni.

- From 2022: member of the "Spoke 3" research subproject 12: "Predictive Analytics for Healthcare Solutions" of the Italian Innovation Ecosystem (PNRR-MUR) research project "Tuscany Health Ecosystem (THE)". Coordinator of the Spoke 3: Prof. Filippo Cavallo. Coordinator of the research subproject 12: Prof. Massimo Riccaboni.

- From 2022: member of the research project "ARCHIVI IN COMUNE - arcHivi lUcca fotoGrafia - HUG", granted by Tuscany Region. Coordinator: Prof. Linda Bertelli.

- From 2022 to 2023: Principal Investigator of the "Contributi Liberali 2022" research project "Application of Matrix Completion Techniques to the Definition of Economic and Financial Recommender Systems", granted by Banca d'Italia. Amount: 3000 Euros.

- 2020: Coordinator of the INdAM-GNAMPA 2020 research project "Trade-off between Number of Examples and Precision in Variations of the Fixed-Effects Panel Data Model", granted by INdAM-GNAMPA (Italian National Institute for High Mathematics, National Group for Mathematical Analysis, Probability, and their Applications). Amount: 1800 Euros.

- 2013: member of the research project "Methodologies for the Approximate Solution of Team Optimization Problems and Strategic Interaction Problems", granted by INdAM-GNAMPA (Italian National Institute for High Mathematics, National Group for Mathematical Analysis, Probability, and their Applications). Coordinator: Prof. Marcello Sanguineti.

- 2009-2010: member of the Italian Research Program of National Interest (PRIN-MIUR) project "Adaptive State Estimation and Adaptive Optimal Control". National Coordinator: Prof. Giorgio Picci. Research unit Coordinator: Prof. Riccardo Zoppoli.

- 2008: member of the "Progetto di Ateneo 2008" of the University of Genoa "Solving Functional Optimization Problems through Nonlinear Approximators and Learning from Data". Coordinator: Prof. Marcello Sanguineti.

- 2006-2008: member of the Italian Research Program of National Interest (PRIN-MIUR) "Models and Algorithms for Robust Network Optimization". National Coordinator: Prof. Matteo Fischetti. Research unit Coordinator: Prof. Paola Zuddas.

- 2006: member of the “Progetto di Ateneo 2006” of the University of Genoa “Application of the Extended Ritz Method to Control Problems”. Coordinator: Prof. Marco Baglietto.

Funding

2023: winner of a fund (as Project Responsible) for the “Regional Call for Research Grants 2023” research project “ROBOFARM – Development of Edge Computing Tools for Robotic Platforms in the Context of Precision Agriculture”, granted by Tuscany Region. Amount: 48000 Euros. Partner of the project: Sigma Ingegneria.

2023: winner of a fund (as Principal Investigator) for the “PRIN PNRR 2022” research project “MOTUS – Automated Analysis and Prediction of Human Movement Qualities”, granted by MUR. Amount: 88093 Euros (IMT side).

2023: winner of a fund (as Unit Responsible and Substitute Principal Investigator) for the “PRIN 2022” research project “MAHATMA – Multiscale Analysis of Human and Artificial Trajectories: Models and Applications”, granted by MUR. Amount: 64010 Euros (IMT side).

2023: winner of a fund for the “INdAM-GNAMPA 2023” research project “Development of Machine-Learning Methods for the Estimation of the Shapley Value and of its Generalizations”, granted by INdAM-GNAMPA (Italian National Institute for High Mathematics, National Group for Mathematical Analysis, Probability, and their Applications). Amount: 2500 Euros.

2022: winner of a fund for the “Contributi Liberali 2022” research project “Application of Matrix Completion Techniques to the Definition of Economic and Financial Recommender Systems”, granted by Banca d’Italia. Amount: 3000 Euros.

2022: winner of a fund for the “Game in Lab 2022” research project “Increasing Accessibility of Online Board Games to Blind and Visually Impaired People via Machine Learning”, granted by Game in Lab. Amount: 15000 Euros.

2020: winner of a fund for the “Galileo 2021” research project “Automatic Movement Analysis Techniques for Applications in Cognitive/Motor Rehabilitation” between Italy and France, granted by the Italian Ministry of University and Research (MUR). Amount: 6700 Euros (Italian side).

2020: winner (together with Prof. Ming Li from Zhejiang Normal University, China) of a fund for the “Research in Pairs” research project “On the Expressive Power of Neural Nets with Random Weights”, granted by ICTP (International Centre for Theoretical Physics) and INdAM (Italian National Institute for High Mathematics). Amount: 1300 Euros.

2020: winner of a fund for the “INdAM-GNAMPA 2020” research project “Trade-off between Number of Examples and Precision in Variations of the Fixed-Effects Panel Data Model”, granted by INdAM-GNAMPA (Italian National Institute for High Mathematics, National Group for Mathematical Analysis, Probability, and their Applications). Amount: 1800 Euros.

2019: winner of a fund for the “Galileo 2019” research project “Should Forests be Restored by Polluters or Deforesters? An Approach based on Game Theory” between Italy and

France, granted by the Italian Ministry of University and Research (MUR). Amount: 5760 Euros (Italian side).

2018: winner of an Erasmus+ teaching grant for teaching the graduate course “Optimization over Time and its Application to Online Machine Learning and Reinforcement Learning” at the University of Cambridge, UK. Amount: 1171 Euros.

2017: winner of an Italian FFABR (“Fondo per il Finanziamento delle Attività Base di Ricerca”, Italian Law 232/2016) research fund, Italian Ministry of University and Research (MUR). Amount: 3000 Euros.

2017: winner of an Erasmus+ teaching grant for teaching the graduate course “Optimization over Time and its Application to Online Machine Learning” at Charles University, Prague. Amount: 1059 Euros.

Scientific memberships

- 2019: member of AIMETA (Italian Association of Theoretical and Applied Mechanics).
- Since 2019: member of AMASES (Italian Association for Mathematics Applied to Economic and Social Sciences).
- 2014, 2015, 2018, 2021: member of AI*IA (Italian Association for Artificial Intelligence).
- Since 2011: member of CNIT (Italian Inter-University Consortium for Telecommunications).
- Since 2009: member of GNAMPA at INdAM (National Group for Mathematical Analysis, Probability, and their Applications – Italian National Institute for Advanced Mathematics), Section 2 (Calculus of Variations, Control Theory and Optimization).
- Since 2007: member of EURO (Association of European Operational Research Societies).
- 2007-2011, 2014, 2015, since 2017: member of AIRO (Italian Operational Research Society).

Institutional activity at the university

2024: member of the selection committee for a Research Collaborator position in Development of Edge Computing Tools for Robotic Platforms in Precision Agriculture at the IMT - School for Advanced Studies, Lucca.

2024: member of the selection committee for a Research Collaborator position in Automated Analysis and Prediction of Human Movement Qualities at the IMT - School for Advanced Studies, Lucca.

2024: member of the selection committee for a Research Collaborator position in Human and Artificial Movement Analysis: Models and Applications at the IMT - School for Advanced Studies, Lucca.

2023: member of the selection committee for a Research Collaborator position in Health Technology Assessment and Statistical Analysis at the IMT - School for Advanced Studies, Lucca.

2023: member of the selection committees for several Visiting Professor positions in: Economic Development and Growth; Industrial Organization; International Economics; Microeconomics; Environmental and Transportation Economics; Mathematical and Quantitative Methods; System Intelligence and Decision Making in Economics and Management at the IMT - School for Advanced Studies, Lucca.

2023: member of the selection committee for a Visiting Professor position in Finite Element Technologies and High Performance Computing for Materials and Structures at the IMT - School for Advanced Studies, Lucca.

2023: member of the selection committee for a Visiting Professor position in Theoretical, Numerical and Experimental Methods for Powder Compaction at the IMT - School for Advanced Studies, Lucca.

2023: member of the selection committee for a Research Collaborator position in Machine Learning, Trade and Innovation at the IMT - School for Advanced Studies, Lucca.

2023: member of the selection committee for a Research Collaborator position in Analysis and Mathematical Modeling of Complex Networks in Real-World Economic, Social and Biological Systems at the IMT - School for Advanced Studies, Lucca.

2022: member of the selection committee for a Research Collaborator position in Trade Network Analysis at the IMT - School for Advanced Studies, Lucca.

2022: member of the selection committee for a Research Collaborator position in Active Architectectured Materials and High-Performance Metamaterials (Computational Methods, Innovative Applications, Experimental Validation of Novel Materials and Technologies) at the University of Chieti-Pescara.

2022: Ph.D. thesis committee member at the IMT - School for Advanced Studies, Lucca. Ph.D. student: Duygu Buyukyazici, Ph.D. program in Systems Science (Ph.D. code: DOT17NG76H), Ph.D. track in Economics, Networks and Business Analytics. Title of the Ph.D. thesis: “*Essays in Applied Economics*”.

2022: member of the committee for the third-year evaluation of an Assistant Professor position in Structural Engineering at the IMT - School for Advanced Studies, Lucca.

From 2021: member of the Library Committee at the IMT - School for Advanced Studies, Lucca.

2021: member of the selection committee for a Research Collaborator position in Expert of Social Listening and Web Scraping” at the IMT - School for Advanced Studies, Lucca.

From 2020: member of the Steering Committee of the 2nd Level Master in Data Science and Statistical Learning (MD2SL) between IMT - School for Advanced Studies, Lucca, and the University of Florence.

2020: Ph.D. thesis committee member at the IMT - School for Advanced Studies, Lucca. Ph.D. student: Falco J. Bargagli Stoffi, Ph.D. program in Institutions, Markets and Technologies (Ph.D. code: DOT138HXG4), Ph.D. track in Economics, Management and Data Science. Title of the Ph.D. thesis: "*Essays on Applied Machine Learning*".

2020: member of the selection committee for a Research Collaborator position in Online Experiments, Surveys and Data Collection at the IMT - School for Advanced Studies, Lucca.

2020: member of the selection committee for a Teaching Assistant position in Calculus I ("Laurea Triennale" course in Civil and Environmental Engineering) at the University of Genoa.

2019-2020: member of the Steering Committee of the inter-university Game Science Research Center.

Since 2019: member of the Scientific Committee of the inter-university Game Science Research Center.

2019: member of the selection committee for a Research Collaborator position in Job-posting Analysis with Text Mining and Topic Modeling Techniques at the IMT - School for Advanced Studies, Lucca.

2019: member of the selection committee for a Visiting Professor position in Graph Theory at the IMT - School for Advanced Studies, Lucca.

2018: mentor of the Ph.D. student Aurora Saibene (University of Milan Bicocca) at the AI*IA 2018 Doctoral Consortium, Foundation Bruno Kessler, Povo (province of Trento).

2018: member of the selection committee for a Post-Doc position in Networks of Innovation at the IMT - School for Advanced Studies, Lucca.

2018: member of the selection committee for an Assistant Professor position in Operations Research at the IMT - School for Advanced Studies, Lucca.

From 2017: member of the Teaching Body ("Collegio dei Docenti") of the Ph.D. Programs in Systems Science (Ph.D. code: DOT17NG76H) and Economics, Analytics and Decision Sciences (Ph.D. code: DOT22E4YT7) at the IMT - School for Advanced Studies, Lucca.

2017: Ph.D. thesis committee member at the IMT - School for Advanced Studies, Lucca. Ph.D. student: Lorenzo Stella, IMT Lucca Ph.D. Program (Ph.D. code: DOT12S1141), Ph.D. track in Computer, Decision, and Systems Science. Title of the Ph.D. thesis: "*Proximal Envelopes: Smooth Optimization Algorithms for Nonsmooth Problems*".

2017: member of the selection committees for two Visiting Professor positions, respectively in Data Science and Complex Networks, and Data Science and Economics, at the IMT - School for Advanced Studies, Lucca.

2017: reviewer of a Ph.D. thesis at the University of Siena. Ph.D. student: Alessandro Rossi, Ph.D. Program in Information Engineering and Science (Ph.D. code: DOT1330351). Title of the Ph.D. thesis: "*Regularization and Learning in the Temporal Domain*".

2015: vice-president at the voting station for the election of a representative of researchers at the IMT - School for Advanced Studies, Lucca.

2015: member of the committee for the third-year evaluation of an Assistant Professor position in Analysis, Control and Optimization of Complex Dynamical Systems at the IMT - School for Advanced Studies, Lucca.

2014: Ph.D. thesis committee member at UniRomaTre. Ph.D. student: Danilo Costarelli. Ph.D. Program in Mathematics (Ph.D. code: DOT03ZP989). Title of the Ph.D. thesis: "*Sigmoidal Functions Approximation and Applications*".

2014: member of the selection committee for an Assistant Professor position in System Identification at the IMT - School for Advanced Studies, Lucca.

2014: member of the selection committee for a Post-Doc position in Computational Mechanics at the IMT - School for Advanced Studies, Lucca.

2014: member of the selection committee for a Research Collaborator position in Computational Modelling at the IMT - School for Advanced Studies, Lucca.

2013-2015: member of the Academic Council at the IMT - School for Advanced Studies, Lucca, as a representative of researchers.

Since 2013: member of the selection committee for the admission to three Ph.D. programs at the IMT - School for Advanced Studies, Lucca. Ph.D. programs: Ph.D. in Institutions, Markets and Technologies (Ph.D. code: DOT138HXG4); Systems Science (Ph.D. code: DOT17NG76H); Economics, Analytics and Decision Sciences (Ph.D. code: DOT22E4YT7).

Since 2022: member of the selection committee for the admission to the 2nd Level Master in Data Science and Statistical Learning (MD2SL) between IMT - School for Advanced Studies, Lucca, and the University of Florence.

Since 2024: member of the examination committee for the following Ph.D. course at the University of Siena: "The Interplay among Cooperative Games, Team Optimization, and Machine Learning: Basic Concepts and Case Studies".

Since 2013: member of the examination committees for the following Ph.D. courses at the IMT - School for Advanced Studies, Lucca:

- Optimal Control;
- Optimal Control and Differential Games;
- Matrix Algebra;
- Basic Linear Algebra and Statistics for Neuroscience (module: Basic Linear Algebra);
- Machine Learning;
- Advanced Topics in Machine Learning.

Since 2020: member of the examination committees for the following courses at the 2nd Level Master in Data Science and Statistical Learning (MD2SL) between IMT - School for Advanced Studies, Lucca, and the University of Florence:

- Machine Learning;
- Advanced Machine Learning;
- Health Analytics and Data-Driven Medicine.

Since 2015: member of the examination committees for the following Ph.D. courses at the University of Genoa:

- An Introduction to Dynamic Optimization and Optimal Control: Models, Solutions, and Approximations;
- An Introduction to Optimization over Time and its Application to Online Machine Learning and Reinforcement Learning.

Since 2007: member of the examination committees for the following courses at the University of Genoa:

- Operations Research 1 ("Laurea" course in Logistics and Transportation Engineering);
- Operations Research 2 ("Laurea" course in Telecommunications Engineering);
- Mathematical and Statistical Methods, and Operations Research ("Laurea" course in Logistics and Transportation Engineering);
- Operations Research ("Laurea" course in Informatics Engineering);
- Operations Research ("Laurea" course in Industrial and Management Engineering);
- "Business Management and Operations Research" ("Laurea" course in Electronic Engineering);
- "Calculus I" ("Laurea Triennale" course in Civil and Environmental Engineering).
- "Game Theory" ("Laurea Magistrale" course in Management Engineering).

Laboratory activity

2005-2012: member of the NOCC laboratory (Nonlinear Optimization, Complexity, and Control Laboratory) at DIST - University of Genoa.

2012-2013: member of the NOCC laboratory (Nonlinear Optimization, Complexity, and Control Laboratory) at DIBRIS - University of Genoa.

Teaching (at the IMT - School for Advanced Studies, Lucca, where up to 2021 only Ph.D. courses were taught)

- Academic Year 2023-2024: teacher of the Ph.D. course “Matlab for Data Science” (20 hours), Ph.D. in Economics, Analytics and Decision Sciences (Ph.D. code: DOT22E4YT7). Also available for the Ph.D. in Systems Science (Ph.D. code: DOT17NG76H).

- Academic Year 2023-2024: teacher of the Ph.D. course “Advanced Topics in Machine Learning” (10 hours), Ph.D. in Economics, Analytics and Decision Sciences (Ph.D. code: DOT22E4YT7). Also available for the Ph.D. in Systems Science (Ph.D. code: DOT17NG76H).

- Academic Year 2023-2024: teacher of the Ph.D. course “Optimal Control and Differential Games” (20 hours), Ph.D. in Economics, Analytics and Decision Sciences (Ph.D. code: DOT22E4YT7). Also available for the Ph.D. in Systems Science (Ph.D. code: DOT17NG76H).

- Academic Year 2023-2024: teacher of the Ph.D. course “Matrix Algebra” (10 hours), Ph.D. in Economics, Analytics and Decision Sciences (Ph.D. code: DOT22E4YT7). Also available for the Ph.D. in Systems Science (Ph.D. code: DOT17NG76H).

- Academic Year 2022-2023: teacher of the Ph.D. course “Matlab for Data Science” (20 hours), Ph.D. in Economics, Analytics and Decision Sciences (Ph.D. code: DOT22E4YT7). Also available for the Ph.D. in Systems Science (Ph.D. code: DOT17NG76H).

- Academic Year 2022-2023: teacher of the Ph.D. course “Advanced Topics in Machine Learning” (10 hours), Ph.D. in Economics, Analytics and Decision Sciences (Ph.D. code: DOT22E4YT7). Also available for the Ph.D. in Systems Science (Ph.D. code: DOT17NG76H).

- Academic Year 2022-2023: teacher of the Ph.D. course “Optimal Control and Differential Games” (20 hours), Ph.D. in Economics, Analytics and Decision Sciences (Ph.D. code: DOT22E4YT7). Also available for the Ph.D. in Systems Science (Ph.D. code: DOT17NG76H).

- Academic Year 2022-2023: teacher of the Ph.D. course “Basic Linear Algebra and Statistics for Neuroscience” (module: “Basic Linear Algebra”, 10 hours), Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences. Also available for the National Ph.D. in Artificial Intelligence.

- Academic Year 2022-2023: teacher of the Ph.D. course “Matrix Algebra” (10 hours), Ph.D. in Economics, Analytics and Decision Sciences (Ph.D. code: DOT22E4YT7). Also available for the Ph.D. in Systems Science (Ph.D. code: DOT17NG76H).

- Academic Year 2021-2022: teacher of the Ph.D. course “Matlab for Data Science”, (20 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering. Also available for the National Ph.D. in Artificial Intelligence.

- Academic Year 2021-2022: teacher of the Ph.D. course “Advanced Topics in Machine Learning” (10 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering. Also available for the Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences. Also available for the National Ph.D. in Artificial Intelligence.

- Academic Year 2021-2022: teacher of the Ph.D. course “Optimal Control” (20 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering. Also available for the National Ph.D. in Artificial Intelligence.

- Academic Year 2021-2022: teacher of the Ph.D. course “Basic Linear Algebra and Statistics for Neuroscience” (module: “Basic Linear Algebra”, 10 hours), Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences. Also available for the National Ph.D. in Artificial Intelligence.

- Academic Year 2021-2022: teacher of the Ph.D. course “Matrix Algebra” (10 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering. Also available for the Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2020-2021: teacher of the Ph.D. course “Applied Data Science” (module: “Matlab Part”, 20 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering.

- Academic Year 2020-2021: teacher of the Ph.D. course “Machine Learning” (20 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering. Also available for the Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2020-2021: teacher of the Ph.D. course “Optimal Control” (20 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering.

- Academic Year 2020-2021: teacher of the Ph.D. course “Basic Linear Algebra and Statistics for Neuroscience” (module: “Basic Linear Algebra”, 10 hours), Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2020-2021: teacher of the Ph.D. course “Matrix Algebra” (10 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering. Also available for the Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2019-2020: teacher of the Ph.D. course “Data Science Lab” (module: “Part III”, 10 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering.

- Academic Year 2019-2020: teacher of the Ph.D. course “Machine Learning” (20 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering. Also available for the Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2019-2020: teacher of the Ph.D. course “Basic Linear Algebra and Statistics for Neuroscience” (module: “Basic Linear Algebra”, 10 hours), Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2019-2020: teacher of the Ph.D. course “Matrix Algebra” (10 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering. Also available for the Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2018-2019: teacher of the Ph.D. course “Machine Learning” (20 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering. Also available for the Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2018-2019: teacher of the Ph.D. course “Optimal Control” (20 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering.

- Academic Year 2018-2019: teacher of the Ph.D. course “Basic Linear Algebra and Statistics for Neuroscience” (module: “Basic Linear Algebra”, 10 hours), Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2018-2019: teacher of the Ph.D. course “Matrix Algebra” (10 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering. Also available for the Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2017-2018: teacher of the Ph.D. course “Machine Learning” (20 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering. Also available for the Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2017-2018: teacher of the Ph.D. course “Optimal Control” (20 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. tracks in: Economics, Networks and Business Analytics; Computer Science and System Engineering.

- Academic Year 2017-2018: teacher of the Ph.D. course “Basic Linear Algebra and Statistics for Neuroscience” (module: “Basic Linear Algebra”, 10 hours), Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2017-2018: teacher of the Ph.D. course “Matrix Algebra” (10 hours), Ph.D. in Systems Science (Ph.D. code: DOT17NG76H). Ph.D. track in Economics, Networks and Business Analytics. Also available for the Ph.D. in Cognitive and Cultural Systems (Ph.D. code: DOT1756VFR). Ph.D. track in Cognitive, Computational and Social Neurosciences.

- Academic Year 2016-2017: teacher of the Ph.D. course “Optimal Control” (20 hours), Ph.D. in Institutions, Markets and Technologies (Ph.D. code: DOT138HXG4). Ph.D. tracks in: Computer Science and System Engineering; Economics, Management and Data Science.

- Academic Year 2016-2017: teacher of the Ph.D. course “Matrix Algebra” (10 hours), Ph.D. in Institutions, Markets and Technologies (Ph.D. code: DOT138HXG4). Ph.D. track in Economics, Management and Data Science.

- Academic Year 2016-2017: 2-hours lecture (October 10th, 2016) on “LASSO estimation” within the Ph.D. course “Analytics and Data Science in Economics and Management, II” held by Prof. Massimo Riccaboni, Ph.D. in Institutions, Markets and Technologies (Ph.D. code: DOT138HXG4). Ph.D. track in Economics, Management and Data Science.

- Academic Year 2015-2016: teacher of the Ph.D. course “Optimal Control” (20 hours + 10 hours of review of Linear Algebra), Ph.D. in Institutions, Markets and Technologies (Ph.D. code: DOT138HXG4). Ph.D. tracks in: Computer Science and System Engineering; Economics, Management and Data Science.

- Academic Year 2014-2015: teacher of the Ph.D. course “Optimal Control” (20 hours), Ph.D. in Institutions, Markets and Technologies (Ph.D. code: DOT138HXG4). Ph.D. tracks in: Computer Science; Control Systems; Image Analysis; Management Science; Economics; Computational Mechanics; Complex Networks.

- Academic Year 2013-2014: teacher of the Ph.D. course “Optimal Control” (20 hours), Ph.D. in Institutions, Markets and Technologies (Ph.D. code: DOT138HXG4). Ph.D. tracks in: Computer, Decision, and System Science; Economics.

Teaching (at the University of Genoa)

- Academic Year 2022-2023: teacher of the course “Game Theory” (54 hours), “Laurea Magistrale” in Management Engineering (teaching code: 60471).

- Academic Year 2022-2023: teacher of the Ph.D. course “An Introduction to Optimization over Time and its Application to Online Machine Learning and Reinforcement Learning” (20 hours), Ph.D. in Computer Science and Systems Engineering (Ph.D. code: DOT1311744).

- Academic Year 2021-2022: teacher of the course “Game Theory” (54 hours), “Laurea Magistrale” in Management Engineering (teaching code: 60471).

- Academic Year 2021-2022: teacher of the Ph.D. course “An Introduction to Optimization over Time and its Application to Online Machine Learning and Reinforcement Learning” (20 hours), Ph.D. in Computer Science and Systems Engineering (Ph.D. code: DOT1311744).

- Academic Year 2020-2021: teacher of the Ph.D. course “An Introduction to Optimization over Time and its Application to Online Machine Learning and Reinforcement Learning” (20 hours), Ph.D. in Computer Science and Systems Engineering (Ph.D. code: DOT1311744).

- Academic Year 2019-2020: teacher of the course “Calculus I” (120 hours), “Laurea Triennale” in Civil and Environmental Engineering (teaching code: 72290).

- Academic Year 2019-2020: teacher of the Ph.D. course “An Introduction to Optimization over Time and its Application to Online Machine Learning and Reinforcement Learning” (20 hours), Ph.D. in Computer Science and Systems Engineering (Ph.D. code: DOT1311744).

- Academic Year 2018-2019: teacher of the Ph.D. course “An Introduction to Optimization over Time and its Application to Online Machine Learning and Reinforcement Learning” (20 hours), Ph.D. in Computer Science and Systems Engineering (Ph.D. code: DOT1311744).

- Academic Year 2017-2018: teacher of the Ph.D. course “An Introduction to Optimization over Time and its Application to Online Machine Learning and Reinforcement Learning” (20 hours), Ph.D. in Computer Science and Systems Engineering (Ph.D. code: DOT1311744).

- Academic Year 2016-2017: teacher of the Ph.D. course “An Introduction to Dynamic Optimization and Optimal Control: Models, Solutions, and Approximations” (20 hours), Ph.D. in Computer Science and Systems Engineering (Ph.D. code: DOT1311744).

- Academic Year 2016-2017: 2-hours lecture (scheduled on May 9th, 2017) on “Team Optimization and its Application to an Economic Problem” within the master course “Game Theory” held by Lucia Pusillo (“Laurea Magistrale” in Mathematics).

- Academic Year 2015-2016: teacher of the Ph.D. course “An Introduction to Dynamic Optimization and Optimal Control: Models, Solutions, and Approximations” (20 hours), Ph.D. in Computer Science and Systems Engineering (Ph.D. code: DOT1311744).

- Academic Year 2014-2015: teacher of the Ph.D. course “An Introduction to Dynamic Optimization and Optimal Control: Models, Solutions, and Approximations” (20 hours), Ph.D. in Computer Science and Systems Engineering (Ph.D. code: DOT1311744).

- Academic Year 2012-13: assistant lecturer and exerciser within the courses:

  - Operations Research (“Laurea Magistrale” in Logistics and Transportation Engineering);
  - Business Management and Operations Research (“Laurea Magistrale” in Electronic Engineering);
  - Operations Research (“Laurea Magistrale” in Informatics Engineering);
  - Operations Research 1 (“Laurea Triennale” in Management Engineering - Savona, University Campus).

- Academic Year 2011-12: assistant lecturer and exerciser (10 hours) within the course of Operations Research (“Laurea Magistrale” in Logistics and Transportation Engineering).

- Academic Year 2011-12: contract Assistant Professor (40 hours) within the courses:

  - Operations Research (“Laurea Magistrale” in Informatics Engineering);
  - Business Management and Operations Research (“Laurea Magistrale” in Electronic Engineering).

- Academic Year 2010-11: contract Assistant Professor (30 hours) within the course of Mathematical and Statistical Methods, and Operations Research (“Laurea Magistrale” in Logistics and Transportation Engineering).

- Academic Year 2007-08: contract Assistant Professor (30 hours) within the course of Operations Research 1 (“Laurea” in Electronic Engineering).

- Academic Year 2006-07: contract Assistant Professor (30 hours; art. 33 Statuto University of Genoa) within the course of Operations Research 1 (“Laurea” in Civil and Environmental Engineering).

- Academic Year 2006-07: contract Assistant Professor (30 hours; art. 33 Statuto University of Genoa) within the course of Operations Research 1 (“Laurea” in Electronic Engineering).

- Since 2007: qualified expert (“Cultore della Materia”) in Operations Research, within the “Laurea” courses in Logistics and Transportation Engineering, Informatics Engineering, Telecommunications Engineering, and Management Engineering.

- 2005-06: contract for the drafting of the lecture notes for the course of Operations Research 1 (“Laurea” in Electronic Engineering).

Teaching (at the University of Siena)

- Academic Year 2023-2024: teacher of the Ph.D. course “The Interplay among Cooperative Games, Team Optimization, and Machine Learning: Basic Concepts and Case Studies” (20 hours), Ph.D. in Information Engineering and Science (Ph.D. code: DOT1330351).

Teaching (at the 2nd Level Master in Data Science and Statistical Learning (MD2SL) between IMT - School for Advanced Studies, Lucca, and the University of Florence)

- Academic Year 2022-2023: teacher of the course “Health Analytics and Data-Driven Medicine” (8 hours).
- Academic Year 2022-2023: teacher of the course “Advanced Machine Learning” (24 hours).
- Academic Year 2021-2022: teacher of the course “Health Analytics and Data-Driven Medicine” (8 hours).
- Academic Year 2021-2022: teacher of the course “Advanced Machine Learning” (24 hours).
- Academic Year 2020-2021: teacher of the course “Supervised and Unsupervised Learning” (module: “Machine Learning”, 24 hours).

Teaching (at Charles University, Prague)

- Academic Year 2017-2018: teacher of the graduate course “Optimization over Time and its Application to Online Machine Learning” (10 hours).

Teaching (at the University of Cambridge, UK)

- Academic Year 2018-2019: teacher of the graduate course “Optimization over Time and its Application to Online Machine Learning and Reinforcement Learning” (15 hours).

Supervision of students

- 2022-2023: advisor of students’ theses for the 2nd Level Master in Data Science and Statistical Learning (MD2SL) between IMT - School for Advanced Studies, Lucca, and the University of Florence. Students: Elisabetta Giacosa, Giovanni Officioso, Giorgio Schiavone.
- From 14/12/2022: co-advisor of Anisie Uwimana, Ph.D. student in Economics, Analytics and Decision Sciences (Ph.D. code: DOT22E4YT7) at the IMT - School for Advanced Studies, Lucca, working in the Analysis of compleX Economic Systems

(AXES) research unit. With her, I coauthored during his Ph.D. studies the joint paper [IJ1] on the application of machine-learning techniques to breast cancer detection.

- From 17/11/2022: advisor of Marco Gregnanin, Ph.D. student in Economics, Analytics and Decision Sciences (Ph.D. code: DOT22E4YT7) at the IMT - School for Advanced Studies, Lucca, working in the Analysis of compleX Economic Systems (AXES) research unit. With him, I coauthored during his Ph.D. studies the joint papers [IJ4, BC1, BC3, BC4] on the application of the signature method to portfolio optimization and community detection, and on the development of dynamic graph neural network models and their application to the analysis of financial data.

- From 01/07/2020 to 29/11/2021: co-advisor of Sara Landi, Ph.D. student in Systems Science (Ph.D. code: DOT17NG76H) at the IMT - School for Advanced Studies, Lucca, Ph.D. track in Economics, Networks and Business Analytics, working in the Analysis of compleX Economic Systems (AXES) research unit. Title of the Ph.D. thesis: "*Public Policy in Italy: An Empirical Analysis on Local Governments and Occupation*", defended in 2021. With her, I coauthored during her Ph.D. studies the joint papers [IJ12, IJ18] on the application of matrix completion to professions/skills matrices.

- From 29/04/2020 to 04/12/2020: co-supervisor of Selene Perazzini, Ph.D. student in Institutions, Markets and Technologies (Ph.D. code: DOT138HXG4) at the IMT - School for Advanced Studies, Lucca, Ph.D. track in Economics, Management and Data Science, working in the Analysis of compleX Economic Systems (AXES) research unit. Title of the Ph.D. thesis: "*Public-Private Insurance for the Management of Natural Disasters*", defended in 2020. With her, I coauthored during her Ph.D. studies the joint papers [IJ6, IJ16, BC5] about natural disaster risk analysis for Italy, and the investigation of related insurance models.

- From 01/01/2020 to 17/12/2020: co-supervisor of Olga Matthiopoulou, Master's Degree student in Computer Science from the University of Genoa. Title of the Master's Degree thesis: "*A Computational Method to Automatically Detect the Perceived Origin of Full-body Human Movement and its Propagation*", defended in 2020. With her, I coauthored during her Master's Degree studies the joint papers [IJ9, CP8] on machine learning applied to movement analysis.

- From 02/11/2017 to 18/01/2022: co-advisor of Federico Nutarelli, Ph.D. student in Systems Science (Ph.D. code: DOT17NG76H) at the IMT - School for Advanced Studies, Lucca, Ph.D. track in Economics, Networks and Business Analytics, working in the Analysis of compleX Economic Systems (AXES) research unit. Title of the P.D. thesis: "*At the Intersection between Machine Learning and Econometrics: Theory and Applications*", defended in 2022. With him, I coauthored during his Ph.D. studies the joint papers [IJ15, IJ19, IJ27, IJ31, IJ36, BC9, LN9] on machine learning.

- From 02/11/2016 to 08/07/2020: co-advisor of Falco J. Bargagli Stoffi, Ph.D. student in Institutions, Markets and Technologies (Ph.D. code: DOT138HXG4) at the IMT - School for Advanced Studies, Lucca, Ph.D. track in Economics, Management and Data Science, working in the Analysis of compleX Economic Systems (AXES) research unit. Title of the Ph.D. thesis: "*Essays on Applied Machine Learning*", defended in 2020. With him, I coauthored during his Ph.D. studies the joint papers [IJ22, IJ23, IJ37, LN8, CP11] on machine learning and causal inference with

applications to economics, and on statistical learning theory applied to the comparison of simple and complex models in supervised machine learning.

- From 19/10/2016 to 14/12/2016: co-advisor of Alessio Cirimele, Master's Degree student in Mathematics at the University of Genoa. Title of the Master's Degree thesis: "*Mathematical Theory of Games and Medicine: the Tau-Value applied to the Analysis of Gene Relevance for Oncology Studies*".

- From 01/11/2015 to 31/10/2018: co-advisor of Luca Boero, Ph.D. student in Science and Technology for Electronic and Telecommunication Engineering (Ph.D. code: DOT1311570) at the University of Genoa. With him, I coauthored during his Ph.D. studies the joint paper [IJ52] on modelling and optimization of intermittently connected networks.

- From 01/11/2014 to 31/10/2017: co-supervisor of Ksenia Kolykhalova, Ph.D. student in Computer Science and Systems Engineering (Ph.D. code: DOT1311744) at the University of Genoa. Title of the Ph.D. thesis: "*Evaluation of Human Movement Qualities: A Methodology Based on Transferable-Utility Games on Graphs*", defended in 2018. With her, I coauthored during her Ph.D. studies the joint papers [IJ32, CP16] on the application of the Shapley value to games defined on graphs, in order to detect leading nodes in a graph representation of human body, using motion capture data.

- From 04/11/2014 to 03/11/2017: co-advisor of Paolo Cinat, Ph.D. student in Institutions, Markets and Technologies (Ph.D. code: DOT138HXG4) at the IMT - School for Advanced Studies, Lucca, Ph.D. track in Computational Mechanics, working in the MUlti-Scale Analysis of Materials (MUSAM) research unit. Title of the Ph.D. thesis: "*Surface Roughness Genomics in Contact Mechanics: A New Method Enabling Roughness Design Towards Surface Prototyping*", defended in 2018. With him, I coauthored during his Ph.D. studies the joint papers [IJ34, IJ39] on optimization applied to civil engineering.

- From 04/11/2013 to 03/11/2016: co-advisor of Benedetta Frassi, Ph.D. student in Institutions, Markets and Technologies (Ph.D. code: DOT138HXG4) at the IMT - School for Advanced Studies, Lucca, Ph.D. track in Economics, working in the Analysis of compleX Economic Systems (AXES) research unit. Title of the Ph.D. thesis: "*Three Essays on Pension Systems and Fiscal Sustainability*", defended in 2017. With her, I coauthored during her Ph.D. studies the joint paper [IJ48] on optimization applied to pension systems.

- From 06/09/2013 to 10/02/2016: supervisor of Rita Morisi, Ph.D. student in the IMT Lucca Ph.D. Program (Ph.D. code: DOT12S1141) at the IMT - School for Advanced Studies, Lucca, Ph.D. track in Computer, Decision, and Systems Science, working in the Dynamical Systems, Control, and Optimization (DYSCO) research unit. Tiitle of the Ph.D. thesis: "*Graph-based Techniques and Spectral Graph Theory in Control and Machine Learning*", defended in 2016. The Ph.D. student Rita Morisi was among the first in her track to complete the Ph.D. in 2016. With her, I coauthored during her Ph.D. studies the joint papers [IJ49, IJ58 IJ59, IJ66, LN11, CP18, CP22] on optimization, machine learning, and control systems.

- From 06/09/2013 to 12/02/2015: supervisor of Mohammed M. Abdelsamea, Ph.D. student in Computer Science and Engineering (Ph.D. code: DOT05S1145) at the IMT

- School for Advanced Studies, Lucca, working in the Dynamical Systems, Control, and Optimization (DYSCO) research unit. Title of the Ph.D. thesis: "*Regional Active Contours Based on Variational Level Sets and Machine Learning for Image Segmentation*", defended in 2015. The Ph.D. student Mohammed M. Abdelsamea was the first in his track to complete the Ph.D. in 2015. With him, I coauthored during his Ph.D. studies the joint papers [IJ65, IJ68, IJ69, IJ70, CP20, CP21] on machine learning for image segmentation.

- From 02/03/2013 to 01/03/2016: co-advisor of Floriane Dardard, Master's Degree student from École Normale Superieure, Paris, during her internship at the University of Genoa (then, from 04/11/2013, Ph.D. student at Télécom Paristech, Paris). With her, I coauthored during her internship and successive Ph.D. studies the joint papers [IJ60, IJ71, IJ77] on machine learning and applications of game theory.

- 2012-2013: supervisor of Master's Degree student projects for the course "Multimodal Systems for Human - Computer Interaction" ("Laurea Magistrale" in Informatics Engineering), held by Proff. Antonio Camurri and Gualtiero Volpe at the University of Genoa. Students: Andrea Ferrando, Gabriele Musso, Davide Punta, Giulio Puri, Fabio Tollini.

- From 01/01/2009 to 31/12/2011: co-advisor of Marco Cello, Ph.D. student in Electronic and Computer Engineering, Robotics and Telecommunications (Ph.D. code: DOT0511941) at the University of Genoa. Title of the Ph.D. thesis: "*Study and Performance Evaluation of Coordinate-Convex Policies in Call Admission Control*", defended in 2012. With him, I coauthored during his Ph.D. studies the joint papers [IJ72, IJ73, IJ79, IJ85, IJ91, CP26, CP27, CP28] on modelling and optimization of networks.

Software knowledge

MATLAB, MAPLE, SCILAB, PYTHON, C++, R, STATA, LINGO, EYESWEB, HTML, OFFICE, LATEX.

Lucca, Italy, 08/11/2024

Giorgio Stefano Gnecco – List of Publications

International books

B1. R. Zoppoli, M. Sanguineti, G. Gnecco, T. Parisini, *"Neural approximations for optimal control and decision"*, 518 pages, 2020. Springer, Switzerland, series "**Communications and Control Engineering**". ISBN: 978-3-030-29691-9.

Papers in international journals

IJ1. A. Uwimana, G. Gnecco, M. Riccaboni, "*Machine learning for breast cancer detection and its health technology assessment: a literature review*", **Computers in Biology and Medicine**, 2024, forthcoming. Elsevier, Netherlands, ISSN: 0010-4825. **IF 2023: 7.0, citations (Scopus): 0**.

IJ2. Biancalani, G. Gnecco, R. Metulini, M. Riccaboni, "*The impact of the European Union emissions trading system on carbon dioxide emissions: a matrix completion analysis*", **Scientific Reports**, vol. 14, article no. 9676, 19 pages, 2024. Springer Nature, Germany, ISSN: 2045-2322. **IF 2023: 3.8, citations (Scopus): 0**.

IJ3. F. Biancalani, G. Gnecco, A. Signori, S. Vismara, "*Financing decisions following negative shocks in the product market: a matrix-completion study of the U.S. pharmaceutical industry*", **Economics Letters**, vol. 243, article no. 111936, 5 pages, 2024. Elsevier, Netherlands, ISSN: 0165-1765. **IF 2023: 2.1, citations (Scopus): 0**.

IJ4. M. Gregnanin, Y. Zhang, J. De Smedt, G. Gnecco, M. Parton, "*Signature-based portfolio allocation: a network approach*", **Applied Network Science**, vol. 9, article no. 54, 37 pages, 2024. Springer, Germany, ISSN: 2364-8228. **IF 2023: 1.3, citations (Scopus): 0**.

IJ5. G. Gnecco, A. Camurri, C. Gasparotti, E. Ceccaldi, G. Volpe, B. Bardy, M. Bieńkiewicz, S. Janaqi, "*Measuring cues of leadership, cohesion, fluidity in joint full-body movement to support embodied interaction design: a pilot study*", **Human Behavior and Emerging Technologies**, vol. 2024, article ID, 1636854, 10 pages, 2024. Wiley, USA, ISSN: 2578-1863. **IF 2023: 4.3, citations (Scopus): 0**.

IJ6. S. Perazzini, G. Gnecco, F. Pammolli, "*A catastrophe model approach for flood risk assessment of Italian municipalities*", **Annals of Operations Research**, 2024, DOI: 10.1007/s10479-024-06060-y. Springer, Germany, ISSN: 0254-5330. **IF 2023: 4.4, citations (Scopus): 0**.

IJ7. E. Agrimi, C. Battaglini, D. Bottari, G. Gnecco, B. Leporini, "*Game accessibility for visually impaired people: a review*", **Soft Computing**, 2024, DOI: 10.1007/s00500-024-09827-4. Springer, Germany, ISSN: 1432-7643. **IF 2023: 3.1, citations (Scopus): 0**.

IJ8. F. Biancalani, G. Gnecco, R. Metulini, M. Riccaboni, "*Prediction of annual CO_2 emissions at the country and sector levels, based on a matrix completion optimization problem*", **Optimization Letters**, 2023, DOI: 10.1007/s11590-023-02052-2. Springer, Germany, ISSN: 1862-4472. **IF 2023: 1.3, citations (Scopus): 3**.

IJ9. O. Matthiopoulou, G. Gnecco, M. Sanguineti, D. Mottet, B. Bardy, A. Camurri, "*Towards the automated analysis of expressive gesture qualities in full-body movement: the perceived origin of movement*", **Human-Centric Computing and Information Sciences**, vol. 14, article no. 54, 22 pages, 2024. Korea Information Processing Society - Computer Software Research Group (KIPS-CSWRG), South Korea, ISSN: 2192-1962. **IF 2023: 3.9, citations (Scopus): 0**.

IJ10. D. Masti, F. Fabiani, G. Gnecco, A. Bemporad, "*Counter-example guided inductive synthesis of control Lyapunov functions for uncertain systems*", **IEEE Control Systems Letters**, vol. 7, pp. 2047-2052, 2023. IEEE, USA, ISSN: 2475-1456. The contents of this paper were also selected for conference presentation by the Program Committee of the 62nd IEEE International Conference on Decision and Control (**IEEE CDC 2023**), Marina Bay Sands, Singapore, December 13th-15th, 2023. **IF 2023: 2.4, citations (Scopus): 0**.

IJ11. G. Gnecco, F. Nutarelli, M. Riccaboni, "*Matrix completion of world trade: an analysis of interpretability through Shapley values*", **The World Economy**, vol. 26, pp. 2707-2731, 2023. Wiley, USA, ISSN: 1467-9701. **IF 2023: 2.6, citations (Scopus): 2**.

IJ12. G. Gnecco, S. Landi, M. Riccaboni, "*The emergence of social soft skill needs in the post COVID-19 era*", **Quality & Quantity**, 2023, vol. 58, pp. 647-680, 2024. Springer, Germany. ISSN: 0033-5177. **IF 2023: -, citations (Scopus): 4**.

IJ13. F. Fantoni, A. Bacigalupo, G. Gnecco, L. Gambarotta, "*Multi-objective optimal design of mechanical metafilters via principal component analysis*", **International Journal of Mechanical Sciences**, vol. 248, article no. 108195, 16 pages, 2023. Elsevier, Netherlands, ISSN: 0020-7403. **IF 2023: 7.1, citations (Scopus): 6**.

IJ14. F. Biancalani, G. Gnecco, R. Metulini, "*The relationship between players' average marginal contributions and salaries: an application to NBA basketball using the generalized Shapley value*", **Italian Journal of Applied Statistics**, vol. 35, pp. 1-29, 2023. Italian Association of Applied Statistics, Italy, ISSN: 1125-1964. **IF 2023: -, citations (Scopus): 0**.

IJ15. A. Bacigalupo, M. L. De Bellis, G. Gnecco, F. Nutarelli, "*On dispersion curve coloring for mechanical metafilters*", **Scientific Reports**, vol. 12, article no. 20019, 13 pages, 2022. Springer Nature, Germany, ISSN: 2045-2322. **IF 2023: 3.8, citations (Scopus): 2**.

IJ16. S. Perazzini, G. Gnecco, F. Pammolli, "*A public-private insurance model for disaster risk management: an application to Italy*", **Italian Economic Journal**, 2022, DOI: 10.1007/s40797-022-00210-6. Springer, Germany, ISSN: 2199-322X. **IF 2023: 1.2, citations (Scopus): 5**.

IJ17. G. Gnecco, Y. Hadas, M. Sanguineti, "*A game-theoretic approach for reliability evaluation of public transportation transfers with stochastic features*", **EURO Journal on Transportation and Logistics**, vol. 11, article no. 100090, 18 pages, 2022. Springer, Germany, ISSN: 2192-4376. **IF 2023: 2.1, citations (Scopus): 1**.

IJ18. G. Gnecco, S. Landi, M. Riccaboni, "*Can machines learn creativity needs? An approach based on matrix completion*", **Italian Economic Journal**, vol. 9, pp. 1111-1151, 2023. Springer, Germany, ISSN: 2199-322X. **IF 2023: 1.2, citations (Scopus): 4**.

IJ19. G. Gnecco, F. Nutarelli, M. Riccaboni, "*A machine learning approach to economic complexity based on matrix completion*", **Scientific Reports**, vol. 12, article no. 9639, 10 pages, 2022. Springer Nature, Germany, ISSN: 2045-2322. **IF 2023: 3.8, citations (Scopus): 8**.

IJ20. R. Metulini, G. Gnecco, F. Biancalani, M. Riccaboni, "*Hierarchical clustering and matrix completion for the reconstruction of world input-output tables*", **AStA Advances in Statistical Analysis**, vol. 107, pp. 575-620, 2023. Springer, Germany, ISSN: 1863-8171. **IF 2023: 1.4, citations (Scopus): 5**.

IJ21. R. Metulini, G. Gnecco, "*Measuring players' importance in basketball using the generalized Shapley value*", **Annals of Operations Research**, vol. 325, pp. 441-465, 2023. Springer, Germany, ISSN: 0254-5330. **IF 2023: 4.4, citations (Scopus): 7**.

IJ22. F. J. Bargagli Stoffi, G. Cevolani, G. Gnecco, "*Simple models in complex worlds: Occam's razor and statistical learning theory*", **Minds and Machines**, vol. 13, pp. 13-42, 2022. Springer, Germany, ISSN: 1572-8641. **IF 2023: 4.2, citations (Scopus): 24**.

IJ23. F. J. Bargagli Stoffi, K. De Witte, G. Gnecco, "*Heterogeneous causal effects with imperfect compliance: a Bayesian machine learning approach*", **Annals of Applied Statistics**, vol. 16, pp. 1986-2009, 2022. Institute of Mathematical Statistics, USA, ISSN: 1932-6157. **IF 2023: 1.3, citations (Scopus): 5**.

IJ24. F. Biancalani, G. Gnecco, M. Riccaboni, "*Price-volume agreements: a one principal/two agents model*", **European Journal of Operational Research**, vol. 300, pp. 296-309, 2022. Elsevier, Netherlands, ISSN: 0377-2217. **IF 2023: 6.0, citations (Scopus): 1**.

IJ25. G. Gnecco, A. Bacigalupo, "*Convex combination of data matrices: PCA perturbation bounds for multi-objective optimal design of mechanical metafilters*", **Mathematical Foundations of Computing**, vol. 4, pp. 253-269, 2021. American Institute of Mathematical Sciences, USA, ISSN: 2577-8838. **IF 2023: 1.3, citations (Scopus): 3**.

IJ26. G. Gnecco, F. Pammolli, B. Tuncay, "*Welfare and research and development incentive effects of uniform and differential pricing schemes*", **Computational Management Science**, vol. 19, pp. 229-268, 2022. Springer, Germany, ISSN: 1619-697X. **IF 2023: 1.3, citations (Scopus): 2**.

IJ27. G. Gnecco, F. Nutarelli, D. Selvi, "*Optimal data collection design in machine learning: the case of the fixed effects generalized least squares panel data model*", **Machine Learning**, vol. 110, pp. 1549-1584, 2021. Springer, Germany, ISSN: 0085-6125. **IF 2023: 4.3, citations (Scopus): 5**.

IJ28. A. Bacigalupo, G. Gnecco, M. Lepidi, L. Gambarotta, "*Computational design of innovative mechanical metafilters via adaptive surrogate-based optimization*", **Computer Methods in Applied Mechanics and Engineering**, vol. 375, article no. 113623, 22 pages, 2021. Elsevier, Netherlands, ISSN: 0045-7825. **IF 2023: 6.9, citations (Scopus): 26**.

IJ29. M. Passacantando, G. Gnecco, Y. Hadas, M. Sanguineti, "*Braess' paradox: a cooperative game-theoretic point of view*", **Networks**, vol. 78, pp. 264-283, 2021. Wiley, USA, ISSN: 1097-0037. **IF 2023: 1.6, citations (Scopus): 6**.

IJ30. P. Lenarda, G. Gnecco, M. Riccaboni, "*Parameter estimation in a 3-parameter p* random graph model*", **Networks**, vol. 77, pp. 403-420, 2021. Wiley, USA, ISSN: 1097-0037. **IF 2023: 1.6, citations (Scopus): 0**.

IJ31. G. Gnecco, F. Nutarelli, D. Selvi, "*Optimal trade-off between sample size, precision of supervision, and selection probabilities for the unbalanced fixed effects panel data model*", **Soft Computing**, vol. 24, pp. 15937-15949, 2020. Springer, Germany, ISSN: 1432-7643. **IF 2023: 3.1, citations (Scopus): 6**.

IJ32. G. Gnecco, Y. Hadas, M. Sanguineti, "*Public transport transfers assessment via transferable utility games and Shapley value approximation*", **Transportmetrica A: Transport Science**, vol. 17, pp. 540-565, 2021. Taylor & Francis, UK, ISSN: 2324-9943. **IF 2023: 3.6, citations (Scopus): 6**.

IJ33. K. Kolykhalova, G. Gnecco, M. Sanguineti, G. Volpe, A. Camurri, "*Automated analysis of the origin of movement: an approach based on cooperative games on graphs*", **IEEE Transactions on Human-Machine Systems**, vol. 50, pp. 550-560, 2020. IEEE, USA, ISSN: 2168-2291. **IF 2023: 3.5, citations (Scopus): 7**.

IJ34. P. Cinat, G. Gnecco, M. Paggi, "*Multi-scale surface roughness optimization through genetic algorithms*", **Frontiers in Mechanical Engineering**, vol. 6, article no. 29, 14 pages, 2020. Frontiers, Switzerland, ISSN: 2297-3079. **IF 2023: 2.0, citations (Scopus): 16**.

IJ35. A. Bacigalupo, G. Gnecco, M. Lepidi, L. Gambarotta, "*Machine-learning techniques for the optimal design of acoustic metamaterials*", **Journal of Optimization Theory and Applications**, vol. 187, pp. 630-653, 2020. Springer, Germany, ISSN: 0022-3239. **IF 2023: 1.6, citations (Scopus): 76**.

IJ36. G. Gnecco, F. Nutarelli, "*On the trade-off between number of examples and precision of supervision in machine learning problems*", **Optimization Letters**, vol. 15, pp. 1711-1733, 2021. Springer, Germany, ISSN: 1862-4472. **IF 2023: 1.3, citations (Scopus): 10**.

IJ37. F. J. Bargagli Stoffi, G. Gnecco, "*Causal tree with instrumental variable: an extension of the causal tree framework to irregular assignment mechanisms*", **International Journal of Data Science and Analytics**, vol. 9, pp. 315-337, 2020. Springer, Germany, ISSN: 2364-415X. **IF 2023: 3.4, citations (Scopus): 11**.

IJ38. A. Bacigalupo, M. L. De Bellis, G. Gnecco, "*Complex frequency band structure of periodic thermo-diffusive materials by Floquet-Bloch theory*", **Acta Mechanica**, vol. 230, pp. 3339-3363, 2019. Springer, Germany, ISSN: 0001-5970. **IF 2023: 2.3, citations (Scopus): 18**.

IJ39. P. Cinat, M. Paggi, G. Gnecco, "*Identification of roughness with optimal contact response with respect to real contact area and normal stiffness*", **Mathematical**

Problems in Engineering, vol. 2019, article ID, 7051512, 11 pages, 2019. Hindawi, USA, ISSN: 1563-5147. **IF 2023: -, citations (Scopus): 6**.

IJ40. G. Gnecco, Y. Hadas, M. Sanguineti, "*Some properties of transportation network cooperative games*", **Networks**, vol. 74, pp. 161-173, 2019. Wiley, USA, ISSN: 1097-0037. **IF 2023: 1.6, citations (Scopus): 8**.

IJ41. A. Bacigalupo, M. Lepidi, G. Gnecco, F. Vadalà, L. Gambarotta, "*Optimal design of the band structure for beam lattice metamaterials*", **Frontiers in Materials**, vol. 6, article no. 6, 14 pages, 2019. Frontiers, Switzerland, ISSN: 2296-8016. **IF 2023: 2.6, citations (Scopus): 35**.

IJ42. G. Gnecco, "*An algorithm for curve identification in the presence of curve intersections*", **Mathematical Problems in Engineering**, vol. 2018, article ID, 7243691, 7 pages, 2018. Hindawi, USA, ISSN: 1563-5147. **IF 2023: -, citations (Scopus): 2**.

IJ43. G. Gnecco, M. Sanguineti, "*Neural approximations in discounted infinite-horizon stochastic optimal control problems"*, **Engineering Applications of Artificial Intelligence**, vol. 72, pp. 294-302, 2018. Elsevier, Netherlands, ISSN: 0952-1976. **IF 2023: 7.5, citations (Scopus): 3**.

IJ44. G. Gnecco, D. Selvi, "*Strong convexity and smoothness of solutions to geometric optics problems via dynamic programming*", **IEEE Control Systems Letters**, vol. 2, pp. 549-554, 2018. IEEE, USA, ISSN: 2475-1456. The contents of this paper were also selected for conference presentation by the Program Committee of the 57th IEEE International Conference on Decision and Control (**IEEE CDC 2018**), Miami Beach, FL, USA, December 17th-19th, 2018. **IF 2023: 2.4, citations (Scopus): 0**.

IJ45. G. Gnecco, "*Symmetric and antisymmetric properties of solutions to kernel-based machine learning problems*", **Neurocomputing**, vol. 306, pp. 141-159, 2018. Elsevier, Netherlands, ISSN: 0925-2312. **IF 2023: 5.5, citations (Scopus): 4**.

IJ46. F. El Ouardighi, K. Kogan, G. Gnecco, M. Sanguineti, "*Transboundary pollution control and environmental absorption efficiency management*", **Annals of Operations Research**, vol. 287, pp. 653-681, 2020. Springer, Germany, ISSN: 0254-5330. **IF 2023: 4.4, citations (Scopus): 20**.

IJ47. G. Gnecco, B. Tuncay, F. Pammolli, "*A comparison of game-theoretic models for parallel trade*", **International Game Theory Review**, vol. 20, no. 3, article ID, 1850003, 57 pages, 2018. World Scientific, Singapore, ISSN: 0219-1989. **IF 2023: 0.4, citations (Scopus): 3**.

IJ48. B. Frassi, G. Gnecco, F. Pammolli, X. Wen, "*Intragenerational redistribution in a funded pension system*", **Journal of Pension Economics and Finance**, vol. 18, pp. 271-303, 2019. Cambridge University Press, UK, ISSN: 1474-7472. **IF 2023: 1.0, citations (Scopus): 4**.

IJ49. R. Morisi, D. N. Manners, G. Gnecco, N. Lanconelli, C. Testa, S. Evangelisti, L. Talozzi, L. L. Gramegna, C. Bianchini, G. Calandra-Bonaura, L. Sambati, G. Giannini, P. Cortelli, C. Tonon, R. Lodi, "*Multi-class parkinsonian disorders classification with quantitative MR markers and graph-based features using support vector machines*",

Parkinsonism & Related Disorders, vol. 47, pp. 64-70, 2018. Elsevier, Netherlands, ISSN: 1353-8020. **IF 2023: 3.1, citations (Scopus): 17**.

IJ50. S. Sebastio, G. Gnecco, "*A green policy to schedule tasks in a distributed cloud*", **Optimization Letters**, vol. 12, pp. 1535-1551, 2018. Springer, Germany, ISSN: 1862-4472. **IF 2023: 1.3, citations (Scopus): 5**.

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LN10. A. Bacigalupo, **G. Gnecco**, M. Lepidi, L. Gambarotta, "*Design of acoustic metamaterials through nonlinear programming*", 2nd International Workshop on Optimization, Machine Learning and Big Data (**MOD 2016**), Volterra, Italy, August 26th-29th, 2016. In "**Lecture Notes in Computer Science**", vol. 10122, pp. 170-181, Springer, Berlin Heidelberg, 2016. ISBN: 978-3-319-51468-0.

LN11. R. Morisi, G. Gnecco, N. Lanconelli, S. Zanigni, D. N. Manners, C. Testa, S. Evangelisti, L. L. Gramegna, C. Bianchini, P. Cortelli, C. Tonon, R. Lodi, "*Binary and multi-class Parkinsonian disorders classification using Support Vector Machines*", 7th Iberian Conference on Pattern Recognition and Image Analysis (**IbPRIA 2015**), Santiago de Compostela, Spain, June 17th-19th, 2015. In "**Lecture Notes in Computer Science**", vol. 9131, pp. 379-386, Springer, Berlin Heidelberg, 2015. ISBN: 978-3-319-19390-8.

LN12. G. Gnecco, M. Gori, S. Melacci, M. Sanguineti, "*Learning with hard constraints*", 23rd International Conference on Artificial Neural Networks (**ICANN 2013**), Sofia, Bulgary, September 10th-13th, 2013. In "**Lecture Notes in Computer Science**", vol. 8131, pp. 146-153, Springer, Berlin Heidelberg, 2013. ISBN: 978-3-642-40727-7.

LN13. **G. Gnecco**, L. Badino, A. Camurri, A. D'Ausilio, L. Fadiga, D. Glowinski, M. Sanguineti, G. Varni, G. Volpe, "*Towards automated analysis of joint music performance in the orchestra*", 3rd International Conference on Arts and Technology (**ArtsIT 2013)**, Milan, Italy, March 21st-23rd, 2013. In "**Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering**", vol. 116, pp. 120-127, Springer, Berlin Heidelberg, 2013. ISBN: 978-3-642-37982-6.

LN14. G. Gnecco, V. Kůrková, M. Sanguineti, "*Bounds for approximate solutions of Fredholm integral equations using kernel networks*", 21st International Conference on Artificial Neural Networks (**ICANN 2011**), Espoo, Finland, June 14th-17th, 2011. In "**Lecture Notes in Computer Science**", vol. 6791, pp. 126-133, Springer, Berlin Heidelberg, 2011. ISBN: 978-3-642-21738-8.

LN15. G. Gnecco, V. Kůrková, M. Sanguineti, "*Some comparisons of model complexity in linear and neural-network approximation*", 20th International Conference on Artificial Neural Networks (**ICANN 2010**), Thessaloniki, Greece, September 15th-18th, 2010. In "**Lecture Notes in Computer Science**", vol. 6354, pp. 358-367, Springer, Berlin Heidelberg, 2010. ISBN: 978-3-642-15819-3.

LN16. **G. Gnecco**, M. Sanguineti, "S*mooth optimal decision strategies for static team optimization problems and their approximations*", 36th International Conference on Current Trends in Theory and Practice of Computer Science (**SOFSEM 2010)**, Špindlerův Mlýn, Czech Republic, January 23rd-29th, 2010. In "**Lecture Notes in Computer Science**", vol. 5901, pp. 440-451, Springer, Berlin Heidelberg, 2010. ISBN: 978-3-642-11265-2.

International conference papers with proceedings, and revision of the full paper

In the following list, I have underlined my name in the cases in which I was/will be the speaker.

CP1. A. Camurri, C. Gasparotti, E. Ceccaldi, A. Cera, B. Bardy, M. Bieńkiewicz, S. Janaqi, G. Volpe, **G. Gnecco**, N. Ferrari, "*Iterative design of two art-inspired experimental scenarios for collecting expressive movement data of individuals and groups*", in Proceedings of the 2024 International Conference on Advanced Visual Interfaces (**AVI 2024**), Arenzano (Genoa), Italy, article no. 92, pp. 1-3, June 3rd-7th, 2024.

CP2. R. Metulini, F. Biancalani, G. Gnecco, "*The generalized Shapley measure for ranking players in basketball: applications and future directions*", in Book of abstracts and short papers of the 14th Scientific Meeting of the Classification and Data Analysis Group (**CLADAG 2023**), Salerno, Italy, pp. 223-226, September 11th-13th, 2023.

CP3. R. Metulini, G. Gnecco, F. Biancalani, M. Riccaboni, "*Assessing the performance of nuclear norm-based matrix completion methods on CO_2 emissions data*", in Book of Short Papers of the 52nd Scientific Meeting of the Italian Statistical Society (**SIS 2023**), Ancona, Italy, June 21st-23rd, 2023.

CP4. R. Metulini, G. Gnecco, F. Biancalani, M. Riccaboni, "*A statistical approach for the completion of input-output tables*", in Book of Short Papers of the 51st Scientific Meeting of the Italian Statistical Society (**SIS 2022**), pp. 1833-1838, Caserta, Italy, June 22nd-24th, 2022.

CP5. A. Bacigalupo, M. L. De Bellis, G. Gnecco, D. Misseroni, "*Wave propagation control in active acoustic metamaterials*", in Proceedings of the International Conference on Metamaterials and Nanophotonics (**METANANO 2021**), online, September 13th-18th, 2021 (published in **Journal of Physics: Conference Series**, vol. 2015, article ID, 012031, 4 pages, 2021). ISSN: 1742-6588.

CP6. **G. Gnecco**, A. Bacigalupo, F. Fantoni, D. Selvi, "*Principal component analysis applied to gradient fields in band gap optimization problems for metamaterials*", in Proceedings of the International Conference on Metamaterials and Nanophotonics (**METANANO 2021**), online, September 13th-18th, 2021 (published in **Journal of Physics: Conference Series**, vol. 2015, article ID, 012047, 4 pages, 2021). ISSN: 1742-6588.

CP7. G. Gnecco, S. Landi, M. Riccaboni, "*Can machines learn creativity needs?*", presented at the 62nd Scientific Annual Meeting of the Italian Society of Economics (**RSA 2021**), 33 pages, online, October 26th-29th, 2021, available at https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=SIE_RSA_62&paper_id=143.

CP8. O. Matthiopoulou, B. Bardy, G. Gnecco, D. Mottet, M. Sanguineti, A. Camurri, "*A computational method to automatically detect the perceived origin of full-body human movement and its propagation*", in Proceedings of the Workshop on Multi-Scale Movement Technologies at the 22nd ACM International Conference on Multimodal Interaction (**ACM ICMI 2020**), pp. 449-453, Utrecht, Netherlands, October 25th-29th, 2020. ISBN: 978-1-4503-8002-7.

CP9. F. Fantoni, A. Bacigalupo, G. Gnecco, "*Frequency band structure of hierarchical viscoelastic metamaterials*", in Proceedings of the International Conference on Metamaterials and Nanophotonics (**METANANO 2020**), Tbilisi, Georgia, September 14th-18th, 2020 (published in American Institute of Physics Conference Proceedings, vol. 2300, article ID, 020029, 2020). ISBN: 978-0-7354-4034-0.

CP10. **G. Gnecco**, F. Fantoni, A. Bacigalupo, "*Uniform and Lipschitz continuity of objective functions in metamaterial band gap optimization problems*", in Proceedings of the International Conference on Metamaterials and Nanophotonics (**METANANO 2020**), Tbilisi, Georgia, September 14th-18th, 2020 (published in American Institute of Physics Conference Proceedings, vol. 2300, article ID, 020038, 2020). ISBN: 978-0-7354-4034-0.

CP11. F. J. Bargagli Stoffi, G. Gnecco, "*Estimating heterogeneous causal effects in the presence of irregular assignment mechanisms*", in Proceedings of the 5th IEEE International Conference on Data Science and Advanced Analytics (**IEEE DSAA 2018**), pp. 1-10, Turin, Italy, October 1st-4th, 2018. ISBN: 978-1-5386-5090-5.

CP12. A. Bacigalupo, **G. Gnecco**, "*Metamaterial filter design via surrogate optimization*", in Proceedings of the International Conference on Metamaterials and Nanophotonics (**METANANO 2018**), Sochi, Russia, September 17th-21st, 2018 (published in **Journal of Physics: Conference Series**, vol. 1092, article ID, 012043, 4 pages, 2018). ISSN: 1742-6588.

CP13. A. Bacigalupo, G. Gnecco, "*Multi-field asymptotic homogenization approach for Bloch wave propagation in periodic thermodiffusive elastic materials*", in Proceedings of the International Conference on Metamaterials and Nanophotonics (**METANANO 2018**), Sochi, Russia, September 17th-21st, 2018 (published in **Journal of Physics: Conference Series**, vol. 1092, article ID, 012006, 3 pages, 2018). ISSN: 1742-6588.

CP14. G. Gnecco, Y. Hadas, M. Sanguineti, "*Game theoretic approach for reliability evaluation of public transportation transfers*", presented at the 14th International Conference on Advanced Systems in Public Transport **(CASPT 2018)**, 16 pages, Brisbane, Australia, July 23rd- 25th, 2018.

CP15. Y. Hadas, G. Gnecco, M. Sanguineti, "*Public transport transfers assessment via transferable-utility games and Shapley-value approximation"*, in Proceedings of the 97th Transportation Research Board 2018 Annual Meeting (**TRB 2018**), paper 18-00929, 17 pages, Washington, D.C., USA, January 7th-11th, 2018, available at

http://amonline.trb.org/2017trb-1.3983622/t016-1.3998037/532-1.3998271/18-00929-1.3995009/18-00929-1.3998296?qr=1

CP16. K. Kolykhalova, G. Gnecco, M. Sanguineti, A. Camurri, G. Volpe, "*Graph-restricted game approach for investigating human movement qualities"*, in Proceedings of the 4th International Conference on Movement Computing (**MOCO '17**), article no. 30, 4 pages, London, UK, June 28th-30th, 2017. ISBN: 978-1-4503-5209-3.

CP17. **G. Gnecco**, M. Gori, S. Melacci, M. Sanguineti, "*Learning with hard constraints as a limit case of learning with soft constraints"*, in Proceedings of the 24th European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (**ESANN 2016**), pp. 35-40, Bruges, Belgium, April 27th-29th, 2016. ISBN: 978-287587027-8.

CP18. **G. Gnecco**, A. Bemporad, R. Morisi, M. Gori, M. Sanguineti, "*Online learning as an LGQ optimal control problem with random matrices*", in Proceedings of the 14th IEEE European Control Conference (**IEEE ECC 2015**), pp. 2487-2494, Linz, Austria, July 15th-17th, 2015. ISBN: 978-3-9524-2693-7.

CP19. X. Wen, F. Pammolli, G. Gnecco, "*Labor supply and capital accumulation in an aging economy: when Beveridge meets Bismarck*", in Proceedings of the 16th Annual Conference of Public Economic Theory (**PET 15**), 40 pages, University of Luxembourg, Luxembourg, July 2nd-4th, 2015, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2664175

CP20. M. M. Abdelsamea, G. Gnecco, M. M. Gaber, "*A concurrent SOM-based Chan-Vese model for image segmentation*", 10th Workshop on Self-Organizing Maps (**WSOM 2014**), Mittweida, Germany, July 2nd-4th, 2014. In "**Advances in Intelligent Systems and Computing**", vol. 295, pp. 199-208, Springer, 2014. ISBN: 978-3-319-07694-2.

CP21. M. M. Abdelsamea, G. Gnecco, M. M. Gaber, "*A survey of SOM-based active contour models for image segmentation*", 10th Workshop on Self-Organizing Maps (**WSOM 2014**), Mittweida, Germany, July 2nd-4th, 2014. In "**Advances in Intelligent Systems and Computing**", vol. 295, pp. 293-302, Springer, 2014. ISBN: 978-3-319-07694-2.

CP22. **G. Gnecco**, R. Morisi, A. Bemporad, *"Sparse solutions to the average consensus problem via l_1-norm regularization of the fastest mixing Markov-chain problem"*, in Proceedings of the 53rd IEEE International Conference on Decision and Control (**IEEE CDC 2014**), pp. 2228-2233, Los Angeles, CA, USA, December 15th-17th, 2014. ISBN: 978-1-4799-7746-8.

CP23. D. Punta, G. Puri, F. Tollini, G. Gnecco, M. Sanguineti, A. Camurri, "*Evaluation of individual contributions in a group estimate of the position of a moving point of common interest*", in Proceedings of the 6th International Conference of Students of Systematic Musicology (**SysMus 2013**), pp. 23-32, Genoa, Italy, September 12th-14th, 2013. ISBN: 978-88-909096-1-0.

CP24. D. Glowinski, G. Gnecco, A. Camurri, S. Piana, "*Expressive non-verbal interaction in string quartet*", in Proceedings of the 5th IEEE International Conference on Affective Computing and Intelligent Interaction (**IEEE ACII 2013**), pp. 233-238, Geneva, Switzerland, September 2nd-5th, 2013. ISBN: 978-0-7695-5048-0.

CP25. M. Gaggero, G. Gnecco, T. Parisini, M. Sanguineti, R. Zoppoli, *"Approximation structures with moderate complexity in functional optimization and dynamic programming*", in Proceedings of the 51st IEEE International Conference on Decision and Control (**IEEE CDC 2012**), pp. 1902-1908, Maui, Hawaii, USA, December 10th-12th, 2012. ISBN: 978-1-4673-2065-8.

CP26. M. Cello, G. Gnecco, M. Marchese, M. Sanguineti, *"An Application to two-hop forwarding of a model of buffer occupancy in ICNs*", in Proceedings of the 7th IEEE International Conference on System of Systems Engineering (**IEEE SOSE 2012**), Genoa, Italy, pp. 491-496, July 16th-19th, 2012. ISBN: 978-1-4673-2975-0.

CP27. M. Cello, G. Gnecco, M. Marchese, M. Sanguineti, "*A generalized stochastic knapsack problem with application in call admission control*", in Proceedings of the 10th Cologne-Twente Workshop (**CTW 2011**), pp. 105-108, Frascati, Italy, June 14th-16th, 2011, available at http://ctw2011.dia.uniroma3.it/ctw_proceedings.pdf

CP28. M. Marchese, M. Cello, G. Gnecco, M. Sanguineti, "*Structural properties of optimal coordinate-convex policies for CAC with nonlinearly-constrained feasibility regions"*, in Proceedings of the 30th IEEE International Conference on Computer Communications (**IEEE INFOCOM *Mini-Conference* 2011**), pp. 466-470, Shanghai, China, April 10th-15th, 2011. ISBN: 978-1-4244-9919-9.

CP29. **G. Gnecco**, M. Sanguineti, "*Suboptimal solutions to network team optimization problems*", in Proceedings of the International Network Optimization Conference (**INOC 2009**), pp. 1-10, Pisa, Italy, April 26th-29th, 2009.

Other presentations at international conferences

In the following list, I have underlined my name in the cases in which I was/will be the speaker.

OP1. A. Camurri, **G. Gnecco**, presentation of the research activity made in the context of the PRIN PNRR 2022 project "Automated Analysis and Prediction of Human Movement Qualities (MOTUS)" at the XXIV Colloquium of Musical Informatics (**XXIV CIM**), Turin, September 30th-October 2nd, 2024.

OP2. P. Bagnerini, M. Gaggero, G. Gnecco, M. Sanguineti, "*Wildland fire diffusion and control: a cooperative game-theoretic model"*, Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2024**), p. 87, Badesi, Italy, September 8th-12th, 2024.

OP3. S. Edet, F. Nutarelli, G. Gnecco, M. Riccaboni, "*Forecasting innovative cities with matrix completion*", presented at the international conference "**Complex System Approaches to 21st Century Challenges: Inequality, Climate Change, and New Technologies**", Santa Fe, USA, July 31st-August 2nd, 2023.

OP4. S. Edet, G. Gnecco, F. Nutarelli, M. Riccaboni, "*Forecasting competitiveness of cities with matrix completion*", in Program of the 7th Geography of Innovation Conference (**GEOINNO2024**), Manchester, UK, January 10th-12th, 2024.

OP5. F. Biancalani, G. Gnecco, R. Metulini, M. Riccaboni, "*The beneficial impact of the EU emissions trading system on CO_2 emissions: a matrix completion analysis*", in Program of the Conference on Climate and Energy Finance, Hannover, Germany, November 3rd-4th, 2023.

OP6. F. El Ouardighi, G. Gnecco, M. Sanguineti, "*Commitment-based strategies for reforestation"*, in Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2023**), pp. 255-256, Ischia, Italy, September 4th-7th, 2023.

OP7. G. Gnecco, Y. Hadas, M. Passacantando, M. Sanguineti, "*On the approximation of the Shapley value via machine learning in parametrized transferable utility games"*, in Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2023**), pp. 257-258, Ischia, Italy, September 4th-7th, 2023.

OP8. O. Matthiopoulou, B. Bardy, A. Camurri, G. Gnecco, D. Mottet, M. Sanguineti, "*Detection of the origin of movement: graph-theoretical model and data processing"*, in Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2022**), p. 181, Florence, Italy, August 30th-September 2nd, 2022.

OP9. A. Bacigalupo, M. L. De Bellis, **G. Gnecco**, F. Nutarelli, "*On dispersion curve coloring"*, in Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2022**), p. 269, Florence, Italy, August 30th-September 2nd, 2022.

OP10. F. El Ouardighi, G. Gnecco, M. Sanguineti, "*How effective is a cooperative agreement between producers and deforesters for forests' restoration?"*, in Book of abstracts of the 15th Viennese Conference on Optimal Control Dynamic Games (**VC 2022**), p. 47, Wien, Austria, July 12th-15th, 2022.

OP11. F. Biancalani, **G. Gnecco**, R. Metulini, M. Riccaboni, "*Matrix completion for the prediction of CO_2 emissions"*, in Program of the 14th Conference of the European Society for Ecological Economics (**ESEE 2022**), Pisa, Italy, June 14th-17th, 2022.

OP12. G. Gnecco, F. Nutarelli, M. Riccaboni, "*Matrix completion of world trade*", in Program of the 23rd Conference on International Economics (**CIE 2022**), Málaga, Spain, June 16th-17th, 2022.

OP13. S. Perazzini, G. Gnecco, F. Pammolli, "*Natural risk assessment of Italian municipalities for residential insurance"*, in Book of abstracts of the 9th International Conference on Risk Analysis (**ICRA 9**), pp. 101-103, Perugia, Italy, May 25th-27th, 2022.

OP14. C. Cagnarini, G. Gnecco, A. Salimonti, F. Zaffina, N. Samad, M. V. Chiriacò, "*Artificial neural network models applied to olive tree phenology in Italy reveal daily insolation control of budbreak"*, in Program of the European Geosciences Union General Assembly 2022 (**EGU 22**), Vienna, Austria, May 23rd-27th, 2022.

OP15. R. Metulini, G. Gnecco, "*Players' importance in basketball and the generalized Shapley value"*, in Book of abstracts of the 14th International Conference of the European Research Consortium for Informatics and Mathematics (ERCIM) Working Group on Computational and Methodological Statistics (**CMStatistics 2021**), p. 81, London, UK, December 18th-20th, 2021.

OP16. G. Gnecco, F. Nutarelli, D. Selvi, "*Optimal data collection design in machine learning: the case of the fixed effects generalized least squares panel data model"*, in Book of abstracts of the 43rd Annual Meeting of the Italian Association for Mathematics Applied to Social and Economic Sciences (**AMASES 2021**), Parallel Session "*Networks, Big Data, and Artificial Intelligence in Economics, Finance, and Social Sciences*", p. 6, Reggio Calabria, Italy, September 13th-18th, 2021.

OP17. A. Bacigalupo, G. Gnecco, F. Nutarelli, D. Selvi, "*On dispersion curve identification"*, in Book of abstract of the International Conference on Optimization and Decision Science (**ODS 2021**), p. 114, Rome, Italy, September 14th-17th, 2021.

OP18. A. Bacigalupo, **G. Gnecco**, "*Multi-objective metafilter optimization"*, in Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2021**), p. 116, Rome, Italy, September 14th-17th, 2021.

OP19. G. Gnecco, M. Sanguineti, A. Camurri, B. Bardy, D. Mottet, "*Comparing features for detecting the origin of movement based on a graph-theoretical cooperative game model"*, in Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2021**), p. 195, Rome, Italy, September 14th-17th, 2021.

OP20. M. Passacantando, G. Gnecco, Y. Hadas, M. Sanguineti, "*Braess paradox via Shapley value"*, in Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2021**), p. 232, Rome, Italy, September 14th-17th, 2021.

OP21. J. Bargagli Stoffi, **G. Gnecco**, G. Cevolani, "*Simple models in complex worlds: Occam's razor and statistical learning theory"*, presented at the Workshop "Philosophy of Science Meets Machine Learning", 3 pages, Tübingen, Germany, November 9th-12th, 2021.

OP22. R. Metulini, G. Gnecco, "*Players' average marginal utility in basketball and generalized Shapley value"*, in Book of abstracts of the 31st European Conference on Operational Research (**EURO 2021**), pp. 274-275, Athens, Greece, July 11th-14th, 2021.

OP23. F. El Ouardighi, G. Gnecco, M. Sanguineti, "*A differential game-theoretical model for pollution control and deforestation"*, in Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2020**), p. 25, Online, November 19th, 2020.

OP24. O. Matthiopoulou, B. Bardy, G. Gnecco, D. Mottet, M. Sanguineti, A. Camurri, "*Detecting the perceived origin of full-body human movement via Shapley values of games on graphs*", in Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2020**), p. 70, Online, November 19th, 2020.

OP25. **G. Gnecco**, F. Raciti, D. Selvi, "*Statistical learning and truncated OLS"*, in Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2020**), p. 72, Online, November 19th, 2020.

OP26. A. Bacigalupo, **G. Gnecco**, M. Lepidi, L. Gambarotta, "*Machine learning techniques for the design of smart metamaterials"*, in Book of abstracts of the 24th Congress of the Italian Association of Theoretical and Applied Mechanics (**AIMETA 2019**), p. 122, Rome, Italy, September 15th-19th, 2019.

OP27. **G. Gnecco**, F. Nutarelli, "*Sample size and precision of supervision: an optimal trade-off based on econometrics and machine learning techniques"*, in Program of the 43rd Annual Meeting of the Italian Association for Mathematics Applied to Social and Economic Sciences (**AMASES 2019**), p. 4, Perugia, Italy, September 9th-11th, 2019.

OP28. K. Kolykhalova, G. Gnecco, M. Sanguineti, A. Camurri, G. Volpe, "*Analysis of human movement qualities via an automated approach based on cooperative games on graphs",* in Program of the International Conference on Optimization and Decision Science (**ODS 2019**), p. 27, Genoa, Italy, September 4th-7th, 2019.

OP29. **G. Gnecco**, F. Nutarelli, "*On the optimal trade-off between sample size and precision of supervision",* in Program of the International Conference on Optimization and Decision Science (**ODS 2019**), p. 16, Genoa, Italy, September 4th-7th, 2019.

OP30. M. Passacantando, G. Gnecco, Y. Hadas, M. Sanguineti, "*Braess' paradox and cooperative games",* in Program of the International Conference on Optimization and Decision Science (**ODS 2019**), p. 27, Genoa, Italy, September 4th-7th, 2019.

OP31. Y. Hadas, G, Gnecco, M. Sanguineti, "*A game theoretic approach for reliability evaluation of public transportation transfers",* in Program of the International Conference on Optimization and Decision Science (**ODS 2019**), p. 21, Genoa, Italy, September 4th-7th, 2019.

OP32. M. Passacantando, G. Gnecco, Y. Hadas, M. Sanguineti, "*An extension of Braess' paradox to transportation network cooperative games"*, in Book of abstracts of the 30th European Conference on Operational Research (**EURO 2019**), p. 22, Dublin, Ireland, June 23rd-26th, 2019.

OP33. F. J. Bargagli Stoffi, K. De Witte, G. Gnecco, "*Heterogeneous causal effects with imperfect compliance. A novel Bayesian machine learning approach"*, poster presentation (best poster award) at the Atlantic Causal Inference Conference 2019 (**ACIC 2019**), Montreal, Canada, May 24th-26th, 2019.

OP34. **G. Gnecco**, Y. Hadas, M. Sanguineti, "*Transferable utility games for the assessment of public transportation transfers"*, in Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2018**), pp. 122-123, Taormina, Italy, September 10th-13th, 2018.

OP35. **G. Gnecco**, Y. Hadas, M. Sanguineti, "*On a family of transportation network cooperative games",* in Book of abstracts of the 29th International Conference of the Association of European Operational Research Societies (**EURO 2018**), p. 85, Valencia, Spain, July 8th-11th, 2018.

OP36. F. J. Bargagli Stoffi, G. Gnecco, "*An extension of the causal tree framework in the presence of irregular assignment mechanisms*", in Program of the 1st European Causal Inference Meeting (**EuroCIM 2018**), p. 2, Florence, Italy, April 11th-13th, 2018.

OP37. Y. Hadas, G. Gnecco, M. Sanguineti, "*An approach to transportation network analysis via transferable utility games*", in Book of abstracts of the 2017 Annual Meeting of the Operations Research Society of Israel (**ORSIS 2017**), p. 23, Ramat Gan, Israel, May 21st-22nd, 2017.

OP38. A. Bacigalupo, **G. Gnecco**, M. Lepidi, L. Gambarotta, "*Phononic band gap optimization of auxetic microstructured filters"*, in Program of the 23rd Congress of the Italian Association of Theoretical and Applied Mechanics (**AIMETA 2017**), p. 20, Salerno, Italy, September 4th-7th, 2017.

OP39. **G. Gnecco**, Y. Hadas, M. Sanguineti, "*A game-theoretic approach to transportation network analysis"*, in Book of abstracts of the International Conference on Optimization and Decision Science (**ODS 2017**), 47th Conference of the Italian Operational Research Society (**AIRO 2017**), p. 81, Sorrento, Italy, September 4th-7th, 2017.

OP40. A. Bacigalupo, G. Gnecco, M. Lepidi, L. Gambarotta, "*Beam-lattice modeling for parametric design of inertial metamaterials"*, in Program of the 2016 International Workshop on Multiscale Innovative Materials and Structures (**MIMS16**), p. 3, Cetara, Italy, October 28th-30th, 2016.

OP41. M. Sanguineti, A. Bemporad, G. Gnecco, M. Gori, "*A novel optimal-control-based model of online learning from data*", in Book of abstracts of the 46th Conference of the Italian Operational Research Society (**AIRO 2016**), p. 151, Trieste, Italy, September 6nd-9th, 2016.

OP42. L. L. Gramegna, C. Testa, R. Morisi, S. Zanigni, G. Gnecco, N. Lanconelli, D. N. Manners, S. Evangelisti, P. Cortelli, C. Tonon, R. Lodi, "*Binary and multi-class classification of parkinsonian disorders with support vector machines based on quantitative brain MR and graph-based features*", in Program of the 7th Annual Congress of the Italian Chapter of the International Society of Magnetic Resonance in Medicine (**ISMRM 2016**), p. 12, Bologna, Italy, February 4th-5th, 2016.

OP43. **G. Gnecco**, F. El Ouardighi, K. Kogan, M. Sanguineti, "*A two-player differential game model for the management of transboundary pollution and environmental absorption*", in Book of abstracts of the 45th Conference of the Italian Operational Research Society (**AIRO 2015**), pp. 306-307, Pisa, Italy, September 7th-10th, 2015.

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OP45. M. Degiorgis, G. Gnecco, S. Gorni, R. Morisi, G. Roth, M. Sanguineti, A. C. Taramasso, "*Evaluating flood hazard at the catchment scale via machine-learning techniques*", in Book of abstracts of the 8th Winter Conference of the Italian Operational Research Society (**AIRO Winter 2015**), Champoluc, Italy, January 25th-30th, 2015.

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