SIMONE GARATTI : CURRICULUM VITAE

BIOGRAPHICAL DATA

Name:	**Simone Garatti**
Place and date of birth:	**Brescia – August 21, 1976**
Nationality:	**Italian**
Language:	**Italian** (mother tongue)**, English**
Contacts:	**Politecnico di Milano**
	Dip. di Elettronica, Informazione e Bioingegneria
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CURRENT POSITION

01/15 –   associate professor at the Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano (research field: Automatic Control – SSD ING-INF/04).

PAST POSITIONS AND APPOINTMENTS

01/05 – 12/14   assistant professor (tenured position) at the Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano (research field: Automatic Control – SSD ING-INF/04).

03/04 – 12/04   research fellow at the Dipartimento di Elettronica e Informazione, Politecnico di Milano, Italy.

VISITING POSITIONS

Aug. 2019   *visiting academic* at the *Department of Engineering Science, University of Oxford, Oxford*, UK.

Aug.-Sep. 2006   *visiting scholar* at the *Department of Mechanical and Aerospace Engineering, University of California San Diego*, San Diego, CA, USA.

Aug. 2003   *visiting student* at the *Lund Institute of Technology, Lund, Sweden*.

EDUCATION

May 2004   **Ph.D.** *cum laude* in Information Technology, Politecnico di Milano, Italy.

Thesis: Assessing the model quality in system identification – the asymptotic theory revisited and application to iterative control. *Advisor*: Prof. S. Bittanti; *Co-advisor*: Prof. M.C. Campi.

Dec. 2000   **M.Sc.** *cum laude* in Computer Science Engineering, Politecnico di Milano, Italy.

Thesis: Una tecnica iterativa per la sintesi del regolatore basata su un approccio robusto in media. *Advisor*: Prof. S. Bittanti; *Co-advisor*: Prof. M.C. Campi.

QUALIFICATIONS

Nov. 2020   national qualification for the full professor position (**ASN I Fascia – settore 09/G1**).

Jan. 2014   national qualification for the associate professor position (**ASN II Fascia – settore 09/G1**).

SCIENTIFIC ACTIVITY

Simone Garatti is the author or co-author of **112 publications**, of which **43** are articles published in the **top tier international journals**, **64** are articles published in the **proceedings of international conferences**, **1** is a **book** with international coverage, and **4** are **book chapters**. The complete list of his **research topics** includes: **data-driven and scenario optimization, sample-based techniques for systems and control design, statistical learning theory, multi-agent distributed optimization and control, system identification and uncertainty quantification, white-box system identification, iterative control design, and data-mining.**

The research activity of Simone Garatti has mainly focused on the development and the theoretical analysis of **innovative schemes for data-driven decision-making with application to the design of intelligent and resilient systems and control schemes**. In particular, Simone Garatti **has pioneered the theory of the scenario approach**, a unitary framework to make designs where the effect of uncertainty is controlled by knowledge drawn from past experience. Simone Garatti's scientific achievements have marked significant **advances not only in the field of systems and control, but have also penetrated other research areas**, such that of stochastic and uncertain optimization and that of machine learning, as witnessed by his **publications in leading journals of these fields and the invitation to prestigious events organized by these communities**, see below. On the applicative side, the paradigms developed by Simone Garatti were adopted in various contexts, including the development of an MPC airplane trajectory tracking controller that is resilient to wind uncertainty and the problem of economic dispatch with uncertain demand due to the ever more important exploitation of renewable sources of energy.

The **significance and international recognition of the Simone Garatti's research activity on data-driven decision making** is witnessed by a **keynote lecture in the IEEE 3rd Conference on Norbert Wiener in the 21st Century** in 2021, a **semi-plenary lecture in the 2022 European Conference on Stochastic Optimization and Computational Management Science (ECSO-CMS)**, and an **invited speaker lecture in the AAAI Workshop on Learnable Optimization (within the 38th Annual AAAI Conference on Artificial Intelligence)**. The importance of the theory of the scenario approach in the context of stochastic optimization earned Simone Garatti the **invitations** to two **Banff International Research Station (BIRS) workshops** in 2018 and 2019 (BIRS workshops aim at gathering selected, world-renowned experts for open discussions on foundational topics) and to the **International School of Mathematics of the Ettore Majorana Foundation and Centre for Scientific Culture** in 2021 (a forum by invitation that brought together experts in stochastic/robust optimization and machine learning for the purpose of discussing recent theoretical developments and identifying interdisciplinary challenges). Moreover, the developments of the scenario approach for stochastic optimization found also recognition among the **Stochastic Programming Society** in that **the first author of article [B.17] below**, a former Ph.D. student who was co-supervised by Simone Garatti, **was awarded of the 2016 COSP student paper prize**. Thanks to its innovative contribution to robust control and finite-sample guarantees in regression problems, **the research on the scenario approach produced by Simone Garatti was the subject of a semi-plenary lecture at the 19th International Symposium on Mathematical Theory of Networks and Systems and of a plenary lecture at the 16th IFAC Symposium on System Identification** (both presented by prof. M.C. Campi) **for which Simone Garatti co-authored the corresponding conference contributions** (articles [C.18], [C.23] in the publication list below). **His early work on white-box identification was instead the subject of a plenary lecture at the 31st Chinese Control Conference** (presented by S. Bittanti) **for which Simone Garatti co-authored the corresponding conference contribution** (article [C.24] below).

Scientific activity metrics
- **no. of citations:**   3981 (Google Scholar) | 2442 (Scopus)
- **h-index:**   23 (Google Scholar) | 20 (Scopus)

In the last **national evaluation of the quality of the research** (VQR 2015-2019), his four selected products have been evaluated: **A, A, A, A** (A = excellent and extremely significant).

PUBLICATIONS

A. Books

[A.1]   M.C. Campi, *S. Garatti*, "*Introduction to the Scenario Approach*", MOS-SIAM series on Optimization, SIAM, 2018.

B. International Journals

[B.1]   *S. Garatti*, M.C. Campi, S. Bittanti, "*Assessing the quality of identified models through the asymptotic theory – When is the result reliable?*", **Automatica (regular paper)**, 40(8): 1319-1332, 2004.

[B.2]   *S. Garatti*, S.M. Savaresi, S. Bittanti, L. La Brocca, "*On the relationships between user profiles and navigation sessions in virtual communities: a data-mining approach*", **Intelligent Data Analysis**, 8(6):579-600, 2004.

[B.3]   *S. Garatti*, M.C. Campi, S. Bittanti, "*The asymptotic model quality assessment for instrumental variable identification revisited*", **System & Control Letters**, 55(6): 494:500, 2006.

[B.4]   *S. Garatti*, S. Bittanti, D. Liberati, A. Maffezzoli, "*An unsupervised clustering approach for leukemia classification based on dna micro-arrays data*", **Intelligent Data Analysis**, 11(2): 175-188, 2007.

[B.5]   M. Campi, *S. Garatti*, "*The exact feasibility of randomized solution of uncertain convex programs*", **SIAM Journal on Optimization**, 19(3): 1211-1230, 2008.

[B.6]   M.C. Campi, G. Calafiore, *S. Garatti*, "*Interval predictor models: identification and reliability*", **Automatica (regular paper)**, 45(2): 382-392, 2009.

[B.7]   M.C. Campi, *S. Garatti*, M. Prandini, "*The scenario approach for systems and control design*", **Annual Reviews in Control**, 33(2):149-157, 2009.

[B.8]   *S. Garatti*, M.C. Campi, S. Bittanti, "*Iterative robust control: speeding up improvement through iterations*", **Systems & Control Letters,** 59(2):139-146, 2010.

[B.9]   *S. Garatti*, R.R. Bitmead, "*On resampling and uncertainty estimation in linear system identification*", **Automatica (regular paper)**, 46(5): 785-795, 2010.

[B.10]   M.C. Campi, *S. Garatti*, "*A sampling-and-discarding approach to chance-constrained optimization: feasibility and optimality*", **Journal on Optimization Theory and Applications**, 148(2):257-280, 2011.

[B.11]   *S. Garatti*, M.C. Campi, "*Modulating robustness in control design – Principles and Algorithms*", **IEEE Control System Magazine**, 33(2):36-51, 2013.

[B.12]   *S. Garatti*, S. Bittanti, "*A new paradigm for parameter estimation in system modeling*", **International Journal of Adaptive Control and Signal Processing**, 7(8):667-687, 2013.

[B.13]   A. Carè, *S. Garatti*, M.C. Campi, "*FAST – Fast Algorithm for the Scenario Technique*", **Operations Research**, 62(3):662-671, 2014.

[B.14]   M. Prandini, *S. Garatti*, R. Vignali, "*Performance assessment and design of abstracted models for stochastic hybrid systems through a randomized approach*", **Automatica (brief paper)**, 50(11): 2852-2860, 2014.

[B.15]   *S. Garatti*, "*A counterexample to the uniqueness of the asymptotic estimate in ARMAX model identification via the correlation approach*", **Systems & Control Letters**, 14(12):14-17, 2014.

[B.16]   L. Bisone, S. Bittanti, S. Canevese, A. De Marco*, S. Garatti*, M. Notaro, V. Prandoni, "*A post-combustion carbon capture process by amines supported on solid pellets - with estimation of kinetic parameters*", **Industrial & Engineering Chemistry Research**, 54(10):2743-2762, 2015.

[B.17]   A. Carè, *S. Garatti*, M.C. Campi, "*Scenario min-max optimization and the risk of empirical costs*", **SIAM Journal on Optimization**, 25(4):2061-2080, 2015. (For this article, the first author **A. Carè was awarded of the 2016 COSP student paper prize by the Stochastic Programming Society**)

[B.18]   L. Deori, *S. Garatti*, M. Prandini, "*Trading performance for state constraint feasibility: a randomized approach*", **Journal of the Franklin Institute**, 354(1):501:529, 2017.

[B.19]   A. Falsone, K. Margellos, *S. Garatti*, M. Prandini, "Dual decomposition for multi-agent distributed optimization with coupling constraints", **Automatica (regular paper)**, 84:149-158, 2017.

[B.20]   A. Carè, *S. Garatti*, M.C. Campi, "*A coverage theory for least squares*", **Journal of the Royal Statistical Society. Series B: Statistical Methodology**, 79(5):1367-1389, 2017.

[B.21]   M.C. Campi, *S. Garatti*, "*Wait-and-judge scenario optimization*", **Mathematical Programming – series B**, 167(1):155-189, 2018.

[B.22]   K. Margellos, A. Falsone, *S. Garatti*, M. Prandini, "*Distributed constrained optimization and consensus in uncertain networks via proximal minimization*", **IEEE Transactions on Automatic Control (full paper)**, 63(5):1372-1387, 2018.

[B.23]   S. Formentin, *S. Garatti*, G. Rallo, S.M. Savaresi, "*Robust direct data-driven controller tuning with an application to vehicle stability control"*, **International Journal of Robust and Nonlinear Control**, 28(12):3752-3765, 2018.

[B.24]   A. Falsone, K. Margellos, *S. Garatti*, M. Prandini, "*Finite-Time Distributed Averaging Over Gossip-Constrained Ring Networks*", **IEEE Transactions on Control of Network Systems**, 5(3):879-997, 2018.

[B.25]   S. Bittanti, *S. Garatti*, "*Analysis of the Kobe earthquake time series via system identification and fault-detection techniques*", **Boletin Geologico y Minero**, 129(3):525-534, 2018.

[B.26]   M.C. Campi, *S. Garatti*, F.A. Ramponi, "*A general scenario theory for non-convex optimization and decision making"*, **IEEE Transactions on Automatic Control (full paper)**, 63(12):4067-4078, 2018.

[B.27]   H. Ming, L. Xie, M.C. Campi, *S. Garatti*, P.R. Kumar, "*Scenario-based Economic Dispatch with Uncertain Demand Response"*, **IEEE Transactions on Smart Grids**, 10(2):1858-1868, 2019.

[B.28]   L. Deori, *S. Garatti*, M. Prandini, "*4-D Flight Trajectory Tracking: A Receding Horizon Approach Integrating Feedback Linearization and Scenario Optimization*", **IEEE Transactions on Control Systems Technology (regular paper)**, 27(3):981-996, 2019.

[B.29]   M.S. Modarresi, L. Xie, M.C. Campi, *S. Garatti*, A. Carè, A. Thatte, P.R. Kumar, "*Scenario-based economic dispatch with tunable risk levels in high-renewable*", **IEEE Transactions on Power Systems**, 34(6):5013-5114, 2019.

[B.30]   A. Carè, *S. Garatti*, M.C. Campi, "*The wait-and-judge scenario approach applied to antenna array design*", **Computational Management Science**, 16(3):481-499, 2019.

[B.31]   *S. Garatti*, M.C. Campi, A. Carè, "*On a class of interval predictor models with universal reliability*", **Automatica (brief paper)**, 110(108542):1-9, 2019.

[B.32]   A. Falsone, L. Deori, D. Ioli, *S. Garatti*, M. Prandini, "*Optimal disturbance compensation for constrained linear systems operating in stationary conditions: a scenario-based approach*", **Automatica (brief paper)**, 110(108537):1-9, 2019.

[B.33]   F. Belluschi, A. Falsone, D. Ioli, K. Margellos, *S. Garatti*, M. Prandini, "*Distributed optimization for structured programs and its application to energy management in a building district*", **Journal of process Control**, 89:11-21, 2020.

[B.34]   L. Deori, *S. Garatti*, M. Prandini, "*A randomized relaxation method to ensure feasibility in stochastic control of linear systems subject to state and input constraints*", **Automatica (brief paper)**, 115(108854):1-9, 2020.

[B.35]   M.C. Campi, *S. Garatti*, "*A theory of the risk for optimization with relaxation and its application to support vector machines*", **Journal of Machine Learning Research**, 22(288):1-38, 2021.

[B.36] M.C. Campi, A. Carè, *S. Garatti, "The scenario approach: A tool at the service of data-driven decision making"*, **Annual reviews in Control (vision article)**, 52:1-17, 2021.

[B.37] *S. Garatti*, M.C. Campi, *"Risk and complexity in scenario optimization"*, **Mathematical Programming**, 191(1):243-279, 2022.

[B.38] A. Falsone, L. Deori, D. Ioli, *S. Garatti*, M. Prandini, *"Optimal steady-state disturbance compensation for constrained linear systems: the Gaussian noise case"*, **IEEE Transactions on Automatic Control (full paper)**, 67(12):6322-6332, 2022.

[B.39] A. Falsone, K. Margellos, J. Zizzo, M. Prandini, *S. Garatti*, *"On the Sensitivity of Linear Resource Sharing Problems to the Arrival of New Agents"*, **IEEE Transactions on Automatic Control (full paper)**, 68(1):272-284, 2023.

[B.40] *S. Garatti*, M.C. Campi, A. Carè, *"Complexity is an effective observable to tune early stopping in scenario optimization"*, **IEEE Transactions on Automatic Control (full paper)**, 68(2):928-942, 2023.

[B.41] *S. Garatti*, M.C. Campi, *"On conditional risk assessment in scenario optimization"*, **SIAM Journal on Optimization**, 33(2):455-480, 2023.

[B.42] M.C. Campi, *S. Garatti*, *"Compression, Generalization and Learning"*, **Journal of Machine Learning Research**, 24(339):1-74, 2023.

[B.43] *S. Garatti*, M.C. Campi, *"Non-convex scenario optimization"*, **Mathematical Programming**, *published online*, 2024. https://doi.org/10.1007/s10107-024-02074-3

C. International conference proceedings

[C.1] S. Bittanti, M.C. Campi, *S. Garatti*, *"An iterative controller design scheme based on average robust control"*, **Proceedings of the 15th IFAC World Congress**, Barcelona, Spain, 2002.

[C.2] S. Bittanti, M.C. Campi, *S. Garatti*, *"New results on the asymptotic theory of system identification for the assessment of the quality of estimated models"*, **Proceedings of the 41st IEEE Conference on Decision and Control**, Las Vegas, Nevada USA, 2002.

[C.3] S. Savaresi, *S. Garatti*, S. Bittanti, L. La Brocca, *"Data-Mining of a large virtual community: relationships between the users DB and the web-log file"*, **Proceedings of the 3rd SIAM International Conference on Data Mining**, San Francisco, California USA, 2003.

[C.4] S. Savaresi , *S. Garatti*, S. Bittanti, *"Modeling the relationships between the user DB and the web-log file of a large virtual community"*, **Proceedings of the 13th IFAC Symposium on System Identification**, Rotterdam, The Netherlands, 2003.

[C.5] *S. Garatti*, S. Bittanti, M.C. Campi, *"Model quality assessment for Instrumental Variable methods: use of the asymptotic theory in practice"*, **Proceedings of the 42nd IEEE Conference on Decision and Control**, Maui, Hawaii USA, 2003.

[C.6] S. Bittanti, M.C. Campi, *S. Garatti*, *"Some critical implementation issues in iterative robust control design"*, **Proceedings of the 8th IFAC workshop on Adaptation and Learning in Control and Signal Processing**, Yokohama, Japan, 2004.

[C.7] S. Bittanti, *S. Garatti*, D. Liberati, *"From DNA microarrays to disease classification: an unsupervised clustering approach"*, **Proceedings of the 16th IFAC world congress**, Prague, Czech Republic, 2005.

[C.8] M.C. Campi, G. Calafiore, *S. Garatti*, *"New results on the identification of interval predictor models"*, **Proceedings of the 16th IFAC world congress**, Prague, Czech Republic, 2005.

[C.9] S. Bittanti, *S. Garatti*, M.C. Campi, *"Introducing robustness in iterative control"*, **Proceedings of the 44th IEEE Conference on Decision and Control**, Seville, Spain, 2005.

[C.10]   M.C. Campi, *S. Garatti*, "*Modulating robustness in robust control: making it easy through randomization*", **Proceedings of the 46th IEEE Conference on Decision and Control**, New Orleans, Louisiana USA, 2007.

[C.11]   *S. Garatti*, S. Bittanti, "*Parameter estimation via artificial data generation with the 'two-stage' approach*", **Proceedings of the 7th World Congress on Intelligent Control and Automation**, Chongqing, China, 2008.

[C.12]   M.C. Campi, *S. Garatti*, M. Prandini, "*The scenario approach for systems and control design*", **Proceedings of the 17th IFAC world congress** (also published in the volume "Plenary Papers, Milestone Reports & Selected Survey Papers", pp. 180-188), Seoul, Korea, 2008.

[C.13]   *S. Garatti*, S. Bittanti, "*Estimation of white-box model parameters via artificial data generation: a two-stage approach*", **Proceedings of the 17th IFAC world congress**, Seoul, Korea, 2008.

[C.14]   S. Bittanti, *S. Garatti*, "*Revisiting the basic issue of parameter estimation in system identification – a new approach for multi-value estimation*", **Proceedings of the 47th IEEE Conference on Decision and Control**, Cancun, Mexico, 2008.

[C.15]   *S. Garatti*, M.C. Campi, "*L-inf layers and the probability of false prediction*", **Proceedings of the 15th IFAC Symposium on System Identification (SYSID)**, Saint-Malo, France, 2009.

[C.16]   *S. Garatti*, S. Bittanti, "*Parameter estimation in the Pacejka's tyre model through the TS method*", **Proceedings of the 15th IFAC Symposium on System Identification (SYSID)**, Saint-Malo, France, 2009.

[C.17]   *S. Garatti*, R.R. Bitmead, "*On re-sampling and uncertainty estimation in linear system identification*", **Proceedings of the 15th IFAC Symposium on System Identification (SYSID)**, Saint-Malo, France, 2009.

[C.18]   M.C. Campi, *S. Garatti*, "*Variable robustness control: principles and algorithms*" (**semi-plenary lecture**), **Proceedings of 19th International Symposium on Mathematical Theory of Networks and Systems (MTNS)**, Budapest, Hungary, 2010.

[C.19]   S. Bittanti, *S. Garatti*, M. Sarati, "*Parameter estimation in induction motors: a comparison between the PE and the TS paradigm*", **Proceedings of the 18th IFAC World Congress**, Milan, Italy, 2011.

[C.20]   A. Carè, *S. Garatti*, M.C. Campi, "*FAST: an algorithm for the scenario approach with reduced sample complexity*", **Proceedings of the 18th IFAC World Congress**, Milan, Italy, 2011.

[C.21]   A. Carè, *S. Garatti*, M.C. Campi, "*Randomized min-max optimization: the exact risk of multiple cost levels*", **Proceedings of the 50th IEEE Conference on Decision and Control and European Control Conference**, Orlando, Florida USA, 2011.

[C.22]   *S. Garatti*, M. Prandini, "*A simulation based approach to the approximation of stochastic hybrid systems*", **Proceedings of the 4th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS 12)**, Eindhoven, The Netherlands, 2012.

[C.23]   M.C. Campi, B.C. Csàji, *S. Garatti*, E. Weyer, "*Certified system identification - towards distribution-free results*" (**plenary lecture**), **Proceedings of the 16th IFAC Symposium on System Identification (SYSID)**, Brussels, Belgium, 2012.

[C.24]   S. Bittanti, *S. Garatti*, "*System Identification and control: a fruitful cooperation over half a century and more*" (**plenary lecture**), **Proceedings of the 31st Chinese Control Conference**, Hefei, China, 2012.

[C.25]   M. Prandini, *S. Garatti*, J. Lygeros, "*A randomized approach to stochastic model predictive control*", **Proceedings of the 51st IEEE Conference on Decision and Control**, Maui, Hawaii USA, 2012.

[C.26]   L. Deori, *S. Garatti*, M. Prandini, "*Stochastic constrained control: trading performance for state constraint feasibility*", **Proceedings of the 12th European Control Conference 2013**, Zurich, Switzerland, 2013.

[C.27] A. Carè, *S. Garatti*, M.C. Campi, *"Least Squares Estimates and the Coverage of Least Squares Costs"*, **Proceedings of the 52nd IEEE Conference on Decision and Control**, Florence, Italy, 2013.

[C.28] A. Carè, *S. Garatti*, M.C. Campi, *"Empirical cost distribution: a scenario approach to the construction of probability boxes with application to channel equalization"*, **Proceedings of the 13th European Control Conference 2014**, Strasbourg, France, 2014.

[C.29] S. Bittanti, *S. Garatti*, *"A model identification approach to the analysis of the Kobe earthquake time series"*, **Proceedings of the International Work-Conference on Time Series Analysis ITISE 2014**, Granada, Spain, 2014.

[C.30] P. Panciatici, M.C. Campi, *S. Garatti*, S.H. Low, D.K. Molzahn, A.X. Sun, L. Wehenkel, *"Advance optimization methods for power systems"* **(plenary lecture), Proceedings of the 18th Power Systems Computation Conference (PSCC 2014)**, Wocrlaw, Poland, 2014.

[C.31] L. Bisone, S. Bittanti, S. Canevese, A. De Marco, *S. Garatti*, M. Notaro, V. Prandoni, *"Modeling and Parameter Identification for CO2 Post-Combustion Capture by Amines Supported on Solid Sorbents"*, **Proceedings of the 19th IFAC World Congress**, Cape Town, South Africa, 2014.

[C.32] L. Deori, *S. Garatti*, M. Prandini, *"Computational approaches to robust Model Predictive Control: a comparative analysis"*, **Proceedings of the 19th IFAC World Congress**, Cape Town, South Africa, 2014.

[C.33] L. Deori, *S. Garatti*, M. Prandini, *"A model predictive control approach to aircraft motion control"*, **Proceedings of the 2015 American Control Conference (ACC 2015)**, Chicago, USA, 2015.

[C.34] L. Deori, *S. Garatti*, M. Prandini, *"Stochastic control with input and state constraints: a relaxation technique to ensure feasibility"*, **Proceedings of the 54th IEEE Conference on Decision and Control**, Osaka, Japan, 2015.

[C.35] M.C. Campi, *S. Garatti*, F. Ramponi, *"Non-convex scenario optimization with application to system identification"*, **Proceedings of the 54th IEEE Conference on Decision and Control**, Osaka, Japan, 2015.

[C.36] H. Nasir, *S. Garatti*, E. Weyer, *"Scenario based Stochastic MPC Schemes for Rivers with Feasibility Assurance"*, **Proceedings of the 15th European Control Conference**, Aalborg, Denmark, 2016.

[C.37] K. Margellos, A. Falsone, *S. Garatti*, M. Prandini, *"Constrained optimal control of stochastic switched affine systems using randomization"*, **Proceedings of the 15th European Control Conference**, Aalborg, Denmark, 2016.

[C.38] K. Margellos, A. Falsone, *S. Garatti*, M. Prandini, *"Proximal minimization based distributed convex optimization"*, **Proceedings of the 2016 American Control Conference**, Boston, MA, USA, 2016.

[C.39] G. Rallo, S. Formentin, *S. Garatti*, S.M. Savaresi, *"Vehicle stability control via VRFT with probabilistic robustness guarantees"*, **Proceedings of the 55th IEEE Conference on Decision and Control**, Las Vegas, NV, USA, 2016.

[C.40] L. Deori, *S. Garatti*, M. Prandini, *"A stochastic strategy integrating wind compensation for trajectory tracking in aircraft motion control"*, **Proceedings of the 55th IEEE Conference on Decision and Control**, Las Vegas, NV, USA, 2016.

[C.41] A. Falsone, K. Margellos, *S. Garatti*, M. Prandini, *"Distributed constrained convex optimization and consensus via dual decomposition and proximal minimization"*, **Proceedings of the 55th IEEE Conference on Decision and Control**, Las Vegas, NV, USA, 2016.

[C.42] L. Bisone, S. Bittanti, M. Casnedi, *S. Garatti*, D. Pareschi, A. Pochiero, *"Estimation in Centrifugal Compressors via Particle Filtering"*, **Proceedings of the 20th IFAC World Congress**, Toulouse, France, 2017.

[C.43] A. Falsone, K. Margellos, *S. Garatti*, M. Prandini, *"Linear programs for resource sharing among heterogeneous agents: the effect of random agent arrivals"*, **Proceedings of the 56th IEEE Conference on Decision and Control,** Melbourne, Australia, 2017.

[C.44] S. Formentin, *S. Garatti*, M.C. Campi, S.M. Savaresi, *"Tuning regularization via scenario optimization"*, **Proceedings of the 56th IEEE Conference on Decision and Control,** Melbourne, Australia, 2017.

[C.45] F. Baronio, M. Baronio, M.C. Campi, A. Caré, *S. Garatti*, G. Perone, *"Ventricular Defibrillation: Classification with G.E.M. and a Roadmap for Future Investigations"*, **Proceedings of the 56th IEEE Conference on Decision and Control,** Melbourne, Australia, 2017.

[C.46] A. Falsone, L. Deori, D. Ioli, *S. Garatti*, M. Prandini, *"Optimally shaping the stationary distribution of a constrained discrete time stochastic linear system via disturbance compensation"*, **Proceedings of the 56th IEEE Conference on Decision and Control,** Melbourne, Australia, 2017.

[C.47] A. Tavakoli, L. De Maria, D. Bartalesi, *S. Garatti*, S. Bittanti, B. Valecillos, U. Piovan, *"Diagnosis of transformers based on vibration data"*, **Proceedings of the 20th IEEE Intenrational Conference on Dielectric Liquids**, Rome, Italy, 2019.

[C.48] *S. Garatti*, M.C. Campi, *"Complexity-based modulation of the data-set in scenario optimization"*, **Proceedings of the 18th European Control Conference**, Naples, Italy, 2019.

[C.49] *S. Garatti*, M.C. Campi, *"Learning for control: a Bayesian scenario approach"*, **Proceedings of the 58th IEEE Conference on Decision and Control**, Nice, France, 2019.

[C.50] A. Falsone, K. Margellos, M. Prandini, *S. Garatti*, *"A scenario-based approach to multi-agent optimization with distributed information"*, **Proceedings of the 21st IFAC World Congress**, Berlin, Germany, 2020.

[C.51] A. Karshenas, K. Margellos, *S. Garatti*, *"An incremental scenario approach for building energy management with uncertain occupancy"*, **Proceedings of the 21st IFAC World Congress**, Berlin, Germany, 2020.

[C.52] A. Tavakoli, L. De Maria, B. Valecillos, D. Bartalesi, *S. Garatti*, S. Bittanti, *"A Machine Learning approach to fault detection in transformers by using vibration data"*, **Proceedings of the 21st IFAC World Congress**, Berlin, Germany, 2020.

[C.53] A. Carè, M.C. Campi, F.A. Ramponi, *S. Garatti*, A.T.J.R. Cobbenhagen, *"A study on majority-voting classifiers with guarantees on the probability of error"*, **Proceedings of the 21st IFAC World Congress**, Berlin, Germany, 2020.

[C.54] M.C. Campi, *S. Garatti, "Scenario Optimization with Relaxation: A New Tool for Design and Application to Machine Learning Problems"*, **Proceedings of the 59th IEEE Conference on Decision and Control**, Jeju Island, Republic of Korea, 2020.

[C.55] V. Rucconi, L. De Maria, D. Bartalesi, B. Valecillos, *S. Garatti*, S. Bittanti, *"No load transformers: vibration spectra analysis by deep learning methods for loose windings detection"*, **Proceedings of the AISEM 2021 annual conference on Sensors and Microsystems**, virtual event, 2021.

[C.56] V. Rucconi, L. De Maria, *S. Garatti*, D. Bartalesi, B. Valecillos, S. Bittanti, *"Deep learning for fault detection in transformers using vibration data"*, **Proceedings of the 19th IFAC Symposium on System Identification**, Padova, Italy, 2021.

[C.57] *S. Garatti*, M.C. Campi, *"The risk of making decisions from data through the lens of the scenario approach"*, **Proceedings of the 19th IFAC Symposium on System Identification**, Padova, Italy, 2021.

[C.58] *S. Garatti*, M.C. Campi, *"On the Consistency of the Risk Evaluation in the Scenario Approach"*, **Proceedings of the 60th IEEE Conference on Decision and Control**, Austin, Texas, USA, 2021.

[C.59]   A. Falsone, K. Margellos, J. Zizzo, M. Prandini, *S. Garatti*, *"New Results on Resource Sharing Problems with Random Agent Arrivals and an Application to Economic Dispatch in Power Systems"*, **Proceedings of the 60th IEEE Conference on Decision and Control**, Austin, Texas, USA, 2021.

[C.60]   V. Rucconi, L. De Maria, D. Bartalesi, B. Valecillos, *S. Garatti*, S. Bittanti, *"Deep Learning for a Comprehensive Transformer Fault Detection Through Vibrational Data"*, **Proceedings of the AISEM 2022 annual conference on Sensors and Microsystems**, Rome, Italy, 2022.

[C.61]   *S. Garatti*, M.C. Campi, *"Compression at the service of learning: a case study for the Guaranteed Error Machine"*, **Proceedings of the 61st IEEE Conference on Decision and Control**, Cancun, Mexico, 2022.

[C.62]   G. Salizzoni, A. Falsone, M. Prandini, *S. Garatti*, *"A scenario solution to state-feedback controller design for discrete time linear systems subject to probabilistic constraints"*, **Proceedings of the 61st IEEE Conference on Decision and Control**, Cancun, Mexico, 2022.

[C.63]   *S. Garatti*, M.C. Campi *"Scenario Optimization with Constraint Relaxation in a Non-Convex Setup: A Flexible and General Framework for Data-Driven Design"*, **Proceedings of the 62nd IEEE Conference on Decision and Control**, Singapore, Singapore, 2023.

[C.64]   D. Paccagnan, M.C. Campi, *S. Garatti*, *"The Pick-to-Learn Algorithm: Empowering Compression for Tight Generalization Bounds and Improved Post-training Performance"*, **Proceedings of the 37th conference on Neural Information Processing Systems (NeurIPS)**, New Orleans, USA, 2023.

D. Chapters of international books

[D.1]   D. Liberati, *S. Garatti*, S. Bittanti, "*Unsupervised mining of genes classifying Leukaemia*", in: **"Encyclopedia of Data Warehousing and Mining"** (ed. J. Wang) – Idea Group Publishing, 2005.

[D.2]   M. Prandini, M.C. Campi, *S. Garatti*, "*Controller design through random sampling: an example*", in: **"Advance in control theory and applications"** (eds. C. Boniventi, A. Isidori, L. Marconi, C. Rossi) – Springer Verlag, LCNIS series, 2007.

[D.3]   *S. Garatti*, M. Prandini, "*Design in presence of uncertainty: the scenario approach*", in: **"Modern Computational Science 12, Optimization"** (eds. R. Leidl, A.K. Hartmann) – BIS-Verlag der Carl von Ossietzky Universitat Oldenburg, 2012.

[D.4]   M.C. Campi, *S. Garatti*, M. Prandini, "*Scenario optimization for MPC*", in: **"Handbook of Model Predictive Control"** (eds. S.V. Rakovic, W.S. Levine) – Birkhauser, 2019.

E. National Journals

[E.1]   D. Liberati, S. Bittanti, *S. Garatti*, Z. Zhao, M. Pappalettera, "*Classificazione di leucemie mediante analisi di dati da microarray*", **Automazione e Strumentazione LIII**(10):79-86, 2005.

RESEARCH PROJECTS

National and international research projects as <u>Principal Investigator</u> of a research unit

▪ Regione Lombardia research project "TEPORE: TErmoregolazione Partecipata e Organizzata per il Residenziale Evoluto" (call: Smart Living, duration: 18 months), 2017-2019.

National and international research projects as Research Collaborator

▪ National research project MIUR COFIN_2000 MM09198819_004 "Nuove tecniche per l'identificazione e il controllo adattativo di sistemi industriali" (duration: 24 months), 2001-2002.

▪ National research project MIUR COFIN_2002 2002094124_005 "Tecniche innovative per l'identificazione e il controllo adattativo di sistemi industriali" (duration: 24 months), 2003-2004.

- National research project MIUR COFIN_2004 2004097303_003 "Metodi ed algoritmi innovativi per l'identificazione e il controllo adattativo di sistemi tecnologici" (duration: 24 months), 2005-2006
- National research project MIUR PRIN_2006 2006094843_004 "Tecniche ed applicazioni innovative di identificazione e controllo adattativo" (duration: 24 months), 2007-2008.
- National research project MIUR PRIN_2008 20085FFJ2Z_005 "Nuovi algoritmi ed applicazioni di identificazione e controllo adattativo" (duration: 24 months), 2010-2011.
- European research project FP7 231143 "Echord: European Clearing House for Open Robotics Development" (duration: 42 months), 2011-2012.
- Regione Lombardia research project "GREEN MOVE" (duration: 24 months), 2011-2012.
- European research project FP7 257005 "MoVeS: Modeling, Verification and Control of Complex System" (duration: 36 months), 2011-2013.
- European research project FP7 643921 "UnCoVerCPS: Unifying Control and Verification of Cyber-Physical Systems" (duration: 36 months), 2014-2017.
- NextGeneration EU research project "FAIR - Future Artificial Intelligence Research" (funded by the NextGeneration EU program within the PNRR-PE-AI scheme, M4C2, Investment 1.3, Line on Artificial Intelligence - duration: 36 months), 2023-2025.
- National research project MIUR PRIN_2022 "The Scenario Approach for Control and Non-Convex Design" (duration: 24 months), 2023-2025. *Project not yet started, but approved for funding*.
- National research project MIUR PRIN_2022_PNRR "A data-driven cooperative framework for the management of distributed energy and water resources" (duration: 24 months), 2023-2025. *Project not started yet, but approved for funding*.

Research projects with industrial partners

- Tiscali SpA (research contract "Comunità virtuali in Internet: ricerca delle relazioni tra i profili degli utenti e i loro percorsi di navigazione mediante tecniche di data-mining", February 5, 2002). Role: research collaborator.
- Whirlpool SpA (research contract "Tuning di modelli comportamentali per apparecchi elettrodomestici", November 26, 2004). Role: research collaborator.
- RSE SpA (research contract "Metodi di machine learning per l'analisi della risposta vibrazionale di trasformatori per l'individuazione di malfunzionamenti", November 25, 2020). Role: research collaborator.
- RSE SpA and Fondazione Politecnico di Milano (research contract "Metodi di addestramento automatico a partire da dati vibrazionali di trasformatori: analisi predittiva del profilo di degrado del trasformatore", August 1, 2023). Role: **research coordinator**.

PLENARY AND INVITED PRESENTATIONS

February 2024: **invited speaker** at the AAAI Workshop on Learnable Optimization (within the 38th Annual AAAI Conference on Artificial Intelligence). Talk: *"Optimization meets AI: trustworthy decisions via the scenario approach"*.

June 2022: **mini-symposium main speaker** at the European Conference on Stochastic Optimization and Computational Management Science (ECSO-CMS) 2022. Talk: *"Scenario optimization with relaxation: a new theory for data-driven decisions with improved performance"*. (In the ECSO-CMS conference the lecture of a main speaker at a mini-symposium is by invitation and is a longer presentation aiming at providing a general overview of a topic; it is regarded as a **semi-plenary lecture**)

July 2021: **keynote speaker** at the IEEE 3rd Conference on Norbert Wiener in the 21st Century, Chennai, India. Talk: *"Data-driven decision making via the scenario approach"*.

May 2021: *invited speaker* at the International School of Mathematics on "Robustness and Resilience in Stochastic Optimization and Statistical Learning: Mathematical Foundations", Ettore Majorana Foundation and Centre for

Scientific Culture, Erice, Italy. Talk: *"The scenario approach as a general tool for risk control in data-driven optimization"*.

January 2019: *invited speaker* at the *BIRS workshop "Models and Algorithms for Sequential Decision Problems under Uncertainty (19w5231)"*, Banff International Research Station, Banff, Canada. Talk: *"Dataset size tuning in scenario optimization"*.

March 2018: *invited speaker* at the *BIRS workshop "Distributionally robust optimization (18w5102)"*, Banff International Research Station, Banff, Canada. Talk: *"Scenario optimization: the performance-risk tradeoff"*.

February 2018: *distinguished speaker* at the 2*018 University of Bergamo/Georgia Institute of Technology 2018 WORKSHOP on Stochastic Optimisation and Data Analytics for Computational Management*, Bergamo. Talk: *"The performance-risk tradeoff in scenario optimization"*.

November 2014: *invited speaker* at the *Brainstorming session on Systems, Control, and Networks*, CNR-IEEIT, Politecnico di Torino. Talk: *"Sample-based optimization: the probability of empirical costs"*.

INVITED SEMINARS

February 2024: invited seminar at *KTH Stockholm* (talk: "Can data play a double role in both designing and certifying solutions? Certified data-driven decision-making via the scenario approach").

November 2022: invited seminar at the *University of Bergamo* (talk: "Data-driven decision making via the scenario approach").

August 2019: invited seminar at the *University of Oxford* (talk: "Dataset size tuning in scenario optimization").

April 2019: invited seminar at the *University of Siena* (talk: "Risk and complexity in data-driven optimization").

May 2018: invited seminar at the *University of Lecce* (talk: "Risk and complexity in scenario optimization").

December 2017: invited seminar at the *University of Melbourne* (talk: "Risk and complexity in scenario optimization").

November 2016: invited seminar at the *University of Oxford* (talk: "Scenario-based optimization: the wait & judge approach").

February 2008: invited seminar at *KTH Royal Institute of Technology* (talk: "Interval Predictor Models: a new identification paradigm").

December 2007: invited seminar at the *Operational Research Center – MIT*, Boston, MA, USA, and at the *Department of Electrical and Computer Engineering – North Eastern University*, Boston, MA, USA. (Talk: "The exact feasibility of randomized solutions to robust optimization: theory and applications"*).*

OTHER RECOGNITIONS

2012: award for the best talk in the "Robust Control" session at the Convegno Annuale dei Docenti e Ricercatori Italiani in Automatica, Benevento, Italy, 2012.

2006: winner of a short-term researcher mobility fellowship from the National Research Council of Italy (CNR) (used as visiting scholar at the University of California San Diego (UCSD), San Diego, CA, USA).

2005: outstanding reviewer of Automatica.

EDITORIAL AND CONFERENCE ORGANIZATION ACTIVITY

Editorial boards

2020 -*present*: **Editor** for the International Journal of Adaptive Control and Signal Processing

2020 -*present*: **Editor** for the journal Machine Learning and Knowledge Extraction

2019-*present*: Member of the Conference Editorial Board (CEB) of the IEEE Control System Society

2013 –2020: Member of the Conference Editorial Board (CEB) of the European Control Association (EUCA)

Conference Organizing Committees

- 6th Learning for Dynamics and Control Conference, 2022 - role: **tutorial chair**
- Automatica.IT 2017 (national meeting of the Italian Automation and Control Society – SIDRA)
- 18th IFAC World Congress, 2011 – role: **publicity co-chair**

Conference Technical and Program Committees

2017-*present*: member of the IFAC Technical Committee on System Identification and Adaptive Control.

2011-*present*: member of the IFAC Technical Committee on Modeling, Identification, and Signal Processing.

2010-*present*: member of the IEEE Control System Society Technical Committee on Computational Aspects of Control System Design.

<u>International Program Committees:</u> 4th Learning for Dynamics and Control Conference, 2022; 3rd Learning for Dynamics and Control Conference, 2021; 60th IEEE Conference on Decision and Control, 2021, 59th IEEE Conference on Decision and Control, 2020; 20th IFAC Symposium on System Identification, 2024, 19th IFAC Symposium on System Identification, 2021, 18th IFAC Symposium on System Identification, 2018; 8th International Conference on Control, Decision and Information Technologies, 2022; 7th International Conference on Control, Decision and Information Technologies, 2020; 6th International Conference on Control, Decision and Information Technologies, 2019; 2016 IEEE Conference on Computer Aided Control System Design - Systems under Uncertainty, 2016; 9th International Conference on Computational Management Science, 2012.

<u>Conference Associated Editor</u>: 22nd IFAC World Congress, 2023, 21st IFAC World Congress, 2020, 20th IFAC World Congress, 2017; 62nd IEEE Conference on Decision and Control, 2023, 61st IEEE Conference on Decision and Control, 2022, 60th IEEE Conference on Decision and Control, 2021, 59th IEEE Conference on Decision and Control, 2020, 58th IEEE Conference on Decision and Control, 2019, 48th IEEE Conference on Decision and Control, 2009; 2023 American Control Conference, 2022 American Control Conference, 2021 American Control Conference, 2020 American Control Conference; 18th European Control Conference, 2020, 17th European Control Conference, 2019, 16th European Control Conference, 2018; 15th European Control Conference, 2016; 14th European Control Conference, 2015; 13th European Control Conference, 2014; 12th European Control Conference, 2013; 23rd International Symposium on Mathematical Theory of Networks and Systems, 2018

Organization of invited sessions, tutorials, and mini-symposia

- Organizer of the mini-symposium "Data-driven optimization: algorithms and theoretical guarantees" – SIAM Conference on Optimization, Seattle, WA, USA, 2023
- Co-organizer of the invited sessions "Risk assessment in learning-based control and decision-making" – 61st IEEE Conference on Decision and Control, Cancun, Mexico, 2022
- Co-organizer of the invited sessions "Data-driven methods for decision and control" – 21st IFAC World Congress, Berlin, Germany, 2020
- Co-organizer of the tutorial "Randomized methods for analysis and design of control systems" 21st IFAC World Congress, Cape Town, South Africa, 2014

Review activity

Simone Garatti has served as a reviewer for the most prestigious international journals in the field (Annals of Operation Research, Automatica, IEEE Transactions on Automatic Control, IEEE Transactions on Circuits and Systems l, IET Control Theory and Applications, International Journal of Adaptive Control and Signal Processing,

International Journal of Robust and Nonlinear Control, Journal of Complexity, Linear Algebra and its Applications, Mathematical Programming, SIAM Journal on Control and Optimization, SIAM Journal on Optimization) and many international conferences (EUCA European Control Conference, American Control Conference, IEEE Conference on Decision and Control, IEEE Multi-conference on Systems and Control, IFAC Symposium on System Identification, IFAC World Congress).

TEACHING ACTIVITY

Simone Garatti has served as **instructor** in many courses offered by the Politecnico di Milano in various Bachelor and Master programs, mainly on the methodological aspects of system identification and adaptive control. He has taught both Italian and English classes. In the last ten years, he has also given various **graduate Ph.D. courses both at the Politecnico di Milano and at foreign universities on advance topics in systems and control design**.

The **quality of the teaching** of Simone Garatti, as annually assessed by the students of each offered course, is typically evaluated **very high** (i.e. with an average - over the students - score no smaller than 3.2 in a scale from 1 to 4).

Undergraduate Teaching at national universities

- A.Y. 04/05 Semester I/II: instructor of the course "Progetto di identificazione ed analisi dei dati", Politecnico di Milano. (2.5 cfu)
- A.Y. 05/06 Semester I/II: instructor of the course "Progetto di identificazione ed analisi dei dati", Politecnico di Milano. (2.5 cfu)
- A.Y. 05/06 Semester I: instructor of the course "Progetto di I.M.A.D.", Politecnico di Milano. (2.5 cfu)
- A.Y. 05/06 Semester I: instructor of the course "Sistemi Adattativi ed ad Apprendimento", Politecnico di Milano. (5 cfu)
- A.Y. 05/06 Semester II: instructor of the course "Identificazione dei Modelli ed Analisi dei Dati", Politecnico di Milano – sede di Como. (5 cfu)
- A.Y. 06/07 Semester I/II: instructor of the course "Progetto di identificazione ed analisi dei dati", Politecnico di Milano. (2.5 cfu)
- A.Y. 06/07 Semester I: instructor of the course "Progetto di I.M.A.D.", Politecnico di Milano. (2.5 cfu)
- A.Y. 06/07 Semester I: instructor of the course "Sistemi Adattativi ed ad Apprendimento", Politecnico di Milano. (5 cfu)
- A.Y. 06/07 Semester II: instructor of the course "Identificazione dei Modelli ed Analisi dei Dati", Politecnico di Milano – sede di Como. (5 cfu)
- A.Y. 07/08 Semester I/II: instructor of the course "Progetto di identificazione ed analisi dei dati", Politecnico di Milano. (2.5 cfu)
- A.Y. 07/08 Semester I: instructor of the course "Progetto di I.M.A.D.", Politecnico di Milano. (2.5 cfu)
- A.Y. 07/08 Semester I: instructor of the course "Sistemi Adattativi ed ad Apprendimento", Politecnico di Milano. (5 cfu)
- A.Y. 07/08 Semester II: instructor of the course "Identificazione dei Modelli ed Analisi dei Dati", Politecnico di Milano – sede di Como. (5 cfu)
- A.Y. 08/09 Semester I: instructor of the course "Progetto di Automatica – parte 2", Politecnico di Milano. (2.5 cfu)
- A.Y. 08/09 Semester I: instructor of the course "Sistemi Adattativi ed ad Apprendimento", Politecnico di Milano. (5 cfu)
- A.Y. 08/09 Semester II: instructor of the course "Model Identification and Data Analysis", Politecnico di Milano – sede di Como. (5 cfu)
- A.Y. 09/10 Semester I: instructor of the course "Progetto di Automatica – parte 2", Politecnico di Milano. (2.5 cfu)
- A.Y. 09/10 Semester I: instructor of the course "Sistemi Adattativi ed ad Apprendimento", Politecnico di Milano. (5 cfu)

- A.Y. 09/10 Semester II: instructor of the course "Model Identification and Data Analysis", Politecnico di Milano – sede di Como. (5 cfu)
- A.Y. 10/11 Semester I: instructor of the course "Sistemi Adattativi ed ad Apprendimento", Politecnico di Milano. (5 cfu)
- A.Y. 10/11 Semester I: instructor of the course "Model Identification and Data Analysis – 2nd module", Politecnico di Milano. (5 cfu)
- A.Y. 10/11 Semester II: instructor of the course "Model Identification and Data Analysis", Politecnico di Milano – sede di Como. (5 cfu)
- A.Y. 11/12 Semester I: instructor of the course "Sistemi Adattativi ed ad Apprendimento", Politecnico di Milano. (5 cfu)
- A.Y. 11/12 Semester I: instructor of the course "Model Identification and Data Analysis – 2nd module", Politecnico di Milano. (5 cfu)
- A.Y. 11/12 Semester II: instructor of the course "Model Identification and Data Analysis", Politecnico di Milano – sede di Como. (5 cfu)
- A.Y. 12/13 Semester I: instructor of the course "Adaptive Systems and Learning", Politecnico di Milano. (5 cfu)
- A.Y. 12/13 Semester I: instructor of the course "Model Identification and Data Analysis – 2nd module", Politecnico di Milano. (5 cfu)
- A.Y. 12/13 Semester II: instructor of the course "Model Identification and Data Analysis", Politecnico di Milano – sede di Como. (5 cfu)
- A.Y. 13/14 Semester I: instructor of the course "Adaptive Systems and Learning", Politecnico di Milano. (5 cfu)
- A.Y. 13/14 Semester I: instructor of the course "Model Identification and Data Analysis – 2nd module", Politecnico di Milano. (5 cfu)
- A.Y. 14/15 Semester I: instructor of the course "Adaptive Systems and Learning", Politecnico di Milano. (5 cfu)
- A.Y. 14/15 Semester II: instructor of the course "Identificazione dei modelli ed analisi dei dati 2", Politecnico di Milano. (5 cfu)
- A.Y. 15/16 Semester I: instructor of the course "Adaptive Systems and Learning", Politecnico di Milano. (5 cfu)
- A.Y. 15/16 Semester I: instructor of the course "Identificazione dei modelli e Data Mining [1]", Politecnico di Milano. (7 cfu)
- A.Y. 16/17 Semester I: instructor of the course "Adaptive Systems and Learning", Politecnico di Milano. (5 cfu)
- A.Y. 16/17 Semester I: instructor of the course "Identificazione dei modelli e Data Mining [1]", Politecnico di Milano. (7 cfu)
- A.Y. 17/18 Semester I: instructor of the course "Adaptive Systems and Learning", Politecnico di Milano. (5 cfu)
- A.Y. 17/18 Semester I: instructor of the course "Identificazione dei modelli e Data Mining [1]", Politecnico di Milano. (7 cfu)
- A.Y. 18/19 Semester I: instructor of the course "Data-driven control systems design", Politecnico di Milano. (5 cfu)
- A.Y. 18/19 Semester I: instructor of the course "Identificazione dei modelli e machine learning [1]", Politecnico di Milano. (7 cfu)
- A.Y. 19/20 Semester I: instructor of the course "Data-driven control systems design", Politecnico di Milano. (5 cfu)
- A.Y. 19/20 Semester I: instructor of the course "Identificazione dei modelli e machine learning [1]", Politecnico di Milano. (7 cfu)
- A.Y. 20/21 Semester I: instructor of the course "Data-driven control systems design", Politecnico di Milano. (5 cfu)
- A.Y. 20/21 Semester I: instructor of the course "Model identification and machine learning [1]", Politecnico di Milano. (7 cfu)

- A.Y. 21/22 Semester I: instructor of the course "Data-driven control systems design", Politecnico di Milano. (5 cfu)
- A.Y. 21/22 Semester I: instructor of the course "Model identification and machine learning [1]", Politecnico di Milano. (7 cfu)
- A.Y. 21/22 Semester II: instructor of the course "Model identification and data analysis – 1st module", Politecnico di Milano. (5 cfu)
- A.Y. 22/23 Semester I: instructor of the course "Data-driven control systems design", Politecnico di Milano. (5 cfu)
- A.Y. 22/23 Semester I: instructor of the course "Model identification and machine learning [1]", Politecnico di Milano. (7 cfu)
- A.Y. 23/24 Semester I: instructor of the course "Data-driven control systems design", Politecnico di Milano. (5 cfu)
- A.Y. 23/24 Semester I: instructor of the course "Model identification and machine learning [1]", Politecnico di Milano. (7 cfu)

Graduate Teaching at national universities

- A.Y. 08/09: instructor of the course "Filtering, data analysis and optimization of uncertain systems". Ph.D. program in Information Technology, Politecnico di Milano. (3 hours)
- A.Y. 14/15: instructor of the course "Sample-based approaches to uncertain optimization – theory and applications". Ph.D. program in Information Technology, Politecnico di Milano. (12 hours)
- A.Y. 15/16: instructor of the course "OPTIMAL FILTERING AND DATA ANALYSIS - from Kolmogorov-Wiener to Kalman". Ph.D. program in Information Technology, Politecnico di Milano. (4 hours)
- A.Y. 16/17: instructor of the course "Data-based approaches to uncertain optimization – theory and applications". Ph.D. program in Information Technology, Politecnico di Milano. (12 hours)
- A.Y. 18/19: instructor of the course "Nonlinear system identification". Ph.D. program in Information Technology, Politecnico di Milano. (5 hours)
- A.Y. 19/20: instructor of the course "Distributed algorithms for optimization and control over networks". Ph.D. program in Information Technology, Politecnico di Milano. (5 hours)
- A.Y. 20/21: instructor of the course "Data-based approaches to uncertain optimization: theory and applications". Ph.D. program in Information Technology, Politecnico di Milano. (12 hours)
- A.Y. 21/22: instructor of the course "Distributed algorithms for optimization and control over networks". Ph.D. program in Information Technology, Politecnico di Milano. (5 hours)
- A.Y. 22/23: instructor of the course "Data-based approaches to uncertain optimization: theory and applications". Ph.D. program in Information Technology, Politecnico di Milano. (12 hours) – *course not started yet, but already approved and scheduled for September 2023*

Graduate Teaching at foreign universities

- Instructor of the course "Randomization in Systems and Control Design: the Scenario Approach", HYCON-EECI Graduate School on Control 2012, Supélec, France, February 13-17, 2012. (10,5 hours)
- Instructor of the course "Design in the presence of uncertainty: The Scenario Approach", 4th Modern Computational Science Summer School, Oldenburg, Germany, August 30-31, 2012 (3 hours).
- Instructor of the course "Uncertain Optimization via Sample-based Approaches", HYCON-EECI Graduate School on Control 2013, Supélec, France, January 21-25, 2013. (10,5 hours)
- Instructor of the course "The Scenario Approach: Theory and Applications", HYCON-EECI International Graduate School on Control 2014, Supélec, France, January 27-31, 2014. (10,5 hours)
- Instructor of the course "The scenario approach for robust control, identification, and machine learning", HYCON-EECI International Graduate School on Control 2015, Supélec, France, February 2-6, 2015. (10,5 hours)
- Instructor of the course "The scenario approach for systems, control, and machine learning", HYCON-EECI International Graduate School on Control 2018, Supélec, France, January 29 – February 2, 2018. (10,5 hours)

- Instructor of the course "The scenario approach: making decisions in an uncertain world (systems, control, machine learning)", HYCON-EECI International Graduate School on Control 2019, Yildiz Technical University, Istanbul, February 4-8, 2019. (10,5 hours)
- Instructor of the course "From Data to Decisions: the Scenario Approach (Systems, Control, Machine Learning)", HYCON-EECI International Graduate School on Control 2020, Indian Institute of Technology, Mumbai, January 27-31, 2020. (10,5 hours)
- Instructor of the course "From Data to Decisions: the Scenario Approach (with Applications to Systems, Control and Machine Learning)", HYCON-EECI International Graduate School on Control 2021, online course, February 8-12, 2021. (10,5 hours)
- Instructor of the course "From Data to Decisions: the Scenario Approach (with Applications to Systems, Control and Machine Learning)", HYCON-EECI International Graduate School on Control 2022, Politecnico di Milano, Milano, January 31 – February 4, 2022. (10,5 hours)
- Instructor of the course "The scenario approach: data science for systems, control, and machine learning", HYCON-EECI International Graduate School on Control 2023 Politecnico di Milano, Milano, February 6-10, 2023. (10,5 hours)

Teaching Assistance

- A.Y. 00/01 Semester II: Teaching assistant of the course "Automatica I", prof. Sergio Bittanti, Politecnico di Milano. (20 hours)
- A.Y. 01/02 Semester II: Teaching assistant of the course "Automatica I", prof. Sergio Bittanti, Milano. (28 hours)
- A.Y. 02/03 Semester I: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati" (V.O.), prof. Sergio Bittanti, Politecnico di Milano. (32 hours)
- A.Y. 02/03 Semester II: Teaching assistant of the course "Automatica I", prof. Sergio Bittanti, Politecnico di Milano. (10 hours)
- A.Y. 03/04 Semester I: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (10 hours)
- A.Y. 03/04 Semester I: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati 2", prof. Sergio Bittanti, Politecnico di Milano. (20 hours)
- A.Y. 03/04 Semester II: Teaching assistant of the course "Segnali e Sistemi", prof. Patrizio Colaneri, Politecnico di Milano. (16 hours)
- A.Y. 03/04 Semester II: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano – sede di Bovisa. (20 hours)
- A.Y. 03/04 Semester II: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Savaresi, Politecnico di Milano – sede di Como. (8 hours)
- A.Y. 04/05 Semester I: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (20 hours)
- A.Y. 04/05 Semester I: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati 2", prof. Sergio Savaresi, Politecnico di Milano. (10 hours)
- A.Y. 04/05 Semester II: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Savaresi, Politecnico di Milano – sede di Como. (16 hours)
- A.Y. 04/05 Semester II: Teaching assistant of the course "Segnali e Sistemi", prof. Patrizio Colaneri, Politecnico di Milano. (20 hours)
- A.Y. 05/06 Semester I: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (20 hours)
- A.Y. 05/06 Semester I: Teaching assistant of the course "Sistemi Adattativi ed ad Apprendimento", prof. Simone Garatti, Politecnico di Milano. (8 hours)
- A.Y. 05/06 Semester II: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Simone Garatti, Politecnico di Milano – sede di Como. (20 hours)
- A.Y. 06/07 Semester I: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (20 hours)

- A.Y. 06/07 Semester I: Teaching assistant of the course "Sistemi Adattativi ed ad Apprendimento", prof. Simone Garatti, Politecnico di Milano. (8 hours)
- A.Y. 06/07 Semester II: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Simone Garatti, Politecnico di Milano – sede di Como. (20 hours)
- A.Y. 07/08 Semester I: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (20 hours)
- A.Y. 07/08 Semester I: Teaching assistant of the course "Sistemi Adattativi ed ad Apprendimento", prof. Simone Garatti, Politecnico di Milano. (8 hours)
- A.Y. 07/08 Semester II: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Simone Garatti, Politecnico di Milano – sede di Como. (20 hours)
- A.Y. 08/09 Semester I: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (20 hours)
- A.Y. 08/09 Semester I: Teaching assistant of the course "Sistemi Adattativi ed ad Apprendimento", prof. Simone Garatti, Politecnico di Milano. (8 hours)
- A.Y. 09/10 Semester I: Teaching assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (20 hours)
- A.Y. 09/10 Semester I: Teaching assistant of the course "Sistemi Adattativi ed ad Apprendimento", prof. Simone Garatti, Politecnico di Milano. (8 hours)
- A.Y. 10/11 Semester I: Teaching assistant of the course "Sistemi Adattativi ed ad Apprendimento", prof. Simone Garatti, Politecnico di Milano. (8 hours)
- A.Y. 11/12 Semester I: Teaching assistant of the course "Sistemi Adattativi ed ad Apprendimento", prof. Simone Garatti, Politecnico di Milano. (8 hours)
- A.Y. 12/13 Semester I: Teaching assistant of the course "Adaptive Systems and Learning", prof. Simone Garatti, Politecnico di Milano. (8 hours)
- A.Y. 13/14 Semester I: Teaching assistant of the course "Adaptive Systems and Learning", prof. Simone Garatti, Politecnico di Milano. (8 hours)
- A.Y. 14/15 Semester I: Teaching assistant of the course "Adaptive Systems and Learning", prof. Simone Garatti, Politecnico di Milano. (20 hours)
- A.Y. 15/16 Semester I: Teaching assistant of the course "Adaptive Systems and Learning", prof. Simone Garatti, Politecnico di Milano. (8 hours)
- A.Y. 16/17 Semester I: Teaching assistant of the course "Adaptive Systems and Learning", prof. Simone Garatti, Politecnico di Milano. (8 hours)
- A.Y. 17/18 Semester I: Teaching assistant of the course "Adaptive Systems and Learning", prof. Simone Garatti, Politecnico di Milano. (20 hours)
- A.Y. 18/19 Semester I: Teaching assistant of the course "Data-driven control systems design", prof. Simone Garatti, Politecnico di Milano. (17 hours)
- A.Y. 19/20 Semester I: Teaching assistant of the course "Data-driven control systems design", prof. Simone Garatti, Politecnico di Milano. (18 hours)
- A.Y. 20/21 Semester I: Teaching assistant of the course "Data-driven control systems design", prof. Simone Garatti, Politecnico di Milano. (18 hours)
- A.Y. 21/22 Semester I: Teaching assistant of the course "Data-driven control systems design", prof. Simone Garatti, Politecnico di Milano. (18 hours)
- A.Y. 22/23 Semester I: Teaching assistant of the course "Data-driven control systems design", prof. Simone Garatti, Politecnico di Milano. (18 hours)
- A.Y. 23/24 Semester I: Teaching assistant of the course "Data-driven control systems design", prof. Simone Garatti, Politecnico di Milano. (18 hours)

Lab assistance

- A.Y. 02/03 Semester II: Lab assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (4 hours)
- A.Y. 03/04 Semester I: Lab assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (6 hours)

- A.Y. 03/04 Semester II: Lab assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano – sede Bovisa. (6 hours)
- A.Y. 04/05 Semester I: Lab assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (6 hours)
- A.Y. 05/06 Semester I: Lab assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (6 hours)
- A.Y. 06/07 Semester I: Lab assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (6 hours)
- A.Y. 07/08 Semester I: Lab assistant of the course "Identificazione dei modelli ed analisi dei dati", prof. Sergio Bittanti, Politecnico di Milano. (6 hours)

PhD Student Supervision

- 2004-2005: supervisor of the minor research project "Steering a timescale by application of control theory" developed by Marcello Farina as a student of the Ph.D. program in Information Technology of the Politecnico di Milano (XIX cycle).
- 2009-2010: supervisor of the minor research project "A new identification approach with application to uncertainty assessment for H-Infinity control" developed by Giovanni Alli as a student of the Ph.D. program in Information Technology of the Politecnico di Milano (XXIV cycle).
- 2010-2012: co-supervisor of the major research project "Data-Based Optimization for Applications to Decision-Making, Identification and Control – A Study of Coverage Properties" developed by Algo Caré as a student of the Ph.D. program in Computer Science and Automation Engineering of the University of Brescia (XXV cycle).
- 2013-2015: supervisor of the major research project of Luca Deori as a student of the Ph.D. program in Information Technology of the Politecnico di Milano (XXVIII cycle).
- 2015-2017: co-supervisor of the major research project of Alessandro Falsone as a student of the Ph.D. program in Information Technology of the Politecnico di Milano (XXX cycle).

Thesis Supervision

Supervision of Master's Thesis

- "Aging prediction in cast-resin transformers via vibrational data and neural networks". Author: Domenico Grimaldi. Supervisor: Simone Garatti. Co-supervisors: S. Bittanti, L. De Maria. April 2024.
- "An incremental scenario solution to MPC with constraint prioritization and applications to HVAC systems". Author: Giacomo Della Bella. Supervisor: Simone Garatti. Co-supervisors: M. Prandini, A. Falsone. April 2022.
- "Shaping the stationary state distribution via state-feedback and the scenario approach". Author: Giulio Salizzoni. Supervisor: Simone Garatti. Co-supervisors: M. Prandini, A. Falsone. December 2021.
- "Deep Learning for Fault Detection in Transformer Using Vibration Data". Author: Valerio Rucconi. Supervisor: Simone Garatti. April 2021.
- "Un algoritmo di ottimizzazione a scenario incrementale per problemi di controllo MPC stocastici". Author: Marco Leone. Supervisor: Simone Garatti. December 2020.
- "Resource and load allocation via linear multiagent optimization: probabilistic certificates of solution stability". Author: Jacopo Zizzo. Supervisor: Simone Garatti. Co-supervisors: M. Prandini, A. Falsone. December 2019.
- "Progetto di un controllore di profondità mediante il metodo VRFT". Author: Gabriele Piccio. Supervisor: Simone Garatti. Co-supervisors: Sergio Bittanti. April 2016.
- "Approcci "data-based" diretti per il progetto di controllori robusti con applicazione in ambito automotive". Author: Matteo Vanoncini. Supervisor: Simone Garatti. Co-supervisor: Simone Formentin. December 2014.
- "Identificazione di modelli lineari e catene di Markov per la predizione della velocità e della direzione del vento nel breve periodo". Author: Antonella Costanzo. Supervisor: Simone Garatti. Co-supervisors: Sergio Bittanti and Maria Prandini. April 2013.
- "Metodi basati sulla randomizzazione per il controllo in ambito stocastico con vincoli sull'ingresso e sullo stato". Author: Luca Deori. Supervisor: Simone Garatti. Co-supervisor: Maria Prandini. Ottobre 2012.

- "A neural network study of predicting seizures in epilepsy". Author: Giuseppe Chindemi. Supervisor: Simone Garatti. Co-supervisor: Sergio Bittanti. July 2012.
- "Stima dei parametri incerti di un motore a induzione : tecniche di identificazione a confronto". Author: Mattia Sarati. Supervisor: Simone Garatti. Co-supervisor: Sergio Bittanti. December 2009.

Co-supervision of Master's Thesis

- "Energy Management of multi-building system via distributed optimization". Author: Fabio Belluschi. Supervisor: Maria Prandini. Co-supervisors: Simone Garatti, Alessandro Falsone. April 2016.
- "Approssimazione di sistemi ibridi stocastici attraverso l'approccio a scenario". Author: Riccardo Maria Vignali. Supervisor: Maria Prandini. Co-supervisor: Simone Garatti. July 2012.
- "Modello di un generatore a vapore e identificazione delle caratteristiche di un flusso bifase a partire dal transitorio dell'impianto". Authors: Lino Fiorita, Eleonora Porro. Supervisor: Sergio Bittanti. Co-supervisors: Antonio de Marco, Simone Garatti, Carlo Sandroni. September 2009.
- "Tecniche di stima parametrica con applicazione al problema dell'identificazione dei parametri di Pacejka di un pneumatico". Author: Carlo Sandroni. Supervisor: Sergio Bittanti. Co-supervisor: Simone Garatti. December 2008.
- "Application of VRFT (Virtual Reference Feedback Tuning) and MPC to a two-fluid single-pass heat exchanger". Author: Paolo Varutti. Supervisors: Sergio Bittanti, Frank Allgower. Co-supervisor: Simone Garatti. April 2007.
- "Identificazione di parametri fisici in sistemi non lineari: un confronto fra tecniche tradizionali e un approccio black-box a 2 passi". Author: Filippo Aspesi. Supervisor: Sergio Bittanti. Co-supervisor: Simone Garatti. December 2006.
- "La tecnologia microarray per lo studio di malattie tumorali: analisi dei dati mediante tecniche di data mining". Author: Andrea Maffezzoli. Supervisor: Sergio Bittanti. Co-supervisors: Diego Liberati, Simone Garatti. July 2003.
- "Metodi basati sull'approccio montecarlo per la valutazione del prezzo di un'opzione finanziaria". Author: Davide Ferraguti. Supervisor: Sergio Bittanti. Co-supervisors: Danilo Tilloca, Simone Garatti. February 2003.

Supervision of Bachelor's Thesis

- "Identificazione di modelli per lo studio di un fenomeno franoso in località Cortenova (LC)". Authors: Vincenzo Guerrisi, Daniele Gianola. Supervisor: Simone Garatti. Co-supervisor: Sergio Bittanti. September 2009.

Co-supervision of Bachelor's Thesis

- "Stima di un parametro nel modello di una turbina: due metodi a confronto". Author: Matteo Garza. Supervisor: Sergio Bittanti. Co-supervisor: Simone Garatti. February 2010.
- "Identificazione di un modello del rendimento settimanale del tasso di cambio dollaro USA-sterlina mediante i dati del COT report". Author: Sergio Iommi. Supervisor: Sergio Bittanti. Co-supervisor: Simone Garatti. April 2008.
- "Modelli PARMA per lo studio della concentrazione di PM10 nella città di Padova". Author: Gabriele Maggioni. Supervisor: Sergio Bittanti. Co-supervisor: Simone Garatti. September 2007.
- "Identificazione sull'indice del fatturato industriale italiano". Author: Matteo Bertasa. Supervisor: Sergio Bittanti. Co-supervisor: Simone Garatti. September 2007
- "Analisi di serie temporali di temperature terrestri globali dal 1880 ad oggi tramite sistemi lineari e reti neurali". Authors: Simone Fontolan, Alessandro Garghetti. Supervisor: Sergio Bittanti. Co-supervisor: Simone Garatti. September 2007
- "Metodi di data mining per la classificazione del traffico telefonico di utenti di una compagnia telefonica". Author: Luca Sisler. Supervisor: Sergio Bittanti. Co-supervisor: Simone Garatti. July 2007.
- "Metodi di analisi di dati per la sintesi di nuovi farmaci: un caso di studio". Author: Leonardo Scamazzo. Supervisor: Sergio Bittanti. Co-supervisors: Simone Garatti, Diego Liberati. September 2005.
- "Data mining per dati genici da microarray". Author: Maria Pia Bazzano, Sabino Abruzzese. Supervisor: Sergio Bittanti. Co-supervisor: Simone Garatti. July 2003.

OTHER INSTITUTIONAL ACTIVITIES

2008-*2024*:   **member of the committee for the evaluation of study plans** for the Bachelor and Master programs in Automation and Control Engineering of the Politecnico di Milano.

2013-*present*:   **member of the board of professors of the Ph.D. program in Information Technology** of the Politecnico di Milano. (In this capacity, he has been internal member of various committees for the final Ph.D. thesis defenses and he served as a member of the committee for the admission at the Information Engineering Ph.D. program in 2015).

2021:   **member of the committee** for the **"Claudio Maffezzoni" best master thesis award**.

2023-*present*:   **vice-chair of the Ph.D. program in Information Technology** of the Politecnico di Milano for the Systems and Control area.

2024-*present*:   **graduation award committee** for the Bachelor and Master programs in Automation and Control Engineering of the Politecnico di Milano.

Simone Garatti has also served as **reviewer of final Ph.D. theses** and/or as **member of the committee for the final Ph.D. thesis defense** for the following Italian and foreign universities:

- University of Bergamo, 2018
- University of Salento, 2018
- University of Siena, 2019
- University of Pavia, 2019
- University of Salento, 2020
- KTH, Stockholm, 2021
- University of Melbourne, 2022
- Politecnico di Torino, 2022
- University of Bologna, 2023
- KTH, Stockholm, 2024

He also served as **member** of the following **committees for Professor qualification/selection**:

- Assistant Professor (tenure-track position), University of Padova, 2017
- Junior Assistant Professor (non-tenured position), University of Brescia, 2020
- Junior Assistant Professor (non-tenured position), Politecnico di Milano, 2021