ALESSANDRO ALLA

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RESEARCH INTERESTS

Scientific Computing, Numerical Analysis, Machine Learning, Data-Driven modeling, Numerical Optimization, Optimization with PDE constraints, Open–Loop Control, Closed–Loop Control, Model Predictive Control, Hamilton–Jacobi–Bellman equations, Reduced Order Modeling, Proper Orthogonal Decomposition, Dynamic Mode Decomposition.

EMPLOYMENT

Sapienza, Università di Roma, Italy. *September 2024 – present*
Associate Professor in the Department of Mathematics.

Università Ca' Foscari di Venezia, Italy. *November 2021 – August 2023*
Senior Researcher (tenure-track) in the Department of Molecular Sciences and Nanosystems.

Pontifical Catholic University (PUC-Rio), Brazil. *March 2021 – October 2021*
Professor Adjunct II (tenured) in the Department of Mathematics.

Pontifical Catholic University (PUC-Rio), Brazil. *August 2017 – February 2021*
Professor Adjunct I (tenure-Track) in the Department of Mathematics.

Florida State University, USA. *February 2016 – July 2017*
PostDoctoral Researcher in the group of Prof. Max Gunzburger.

University of Hamburg, Germany. *February 2014 – January 2016*
PostDoctoral Researcher in the group of Prof. Michael Hinze.

EDUCATION

Sapienza, University of Rome, Italy. *November 2010 – January 2014*
Ph.D. in Applied Mathematics.
Advisor: Prof. Maurizio Falcone.
Thesis: *Model Reduction for a Dynamic Programming Approach to Optimal Control Problems with PDE Constraints*.
Committee: Prof. Elisabetta Carlini, Prof. Michael Hinze, Prof. Gianluigi Rozza.

Sapienza, University of Rome, Italy. *September 2007 – December 2009*
M.Sc. in Applied Mathematics
Advisor: Prof. Maurizio Falcone.
Final Evaluation: 110/110 (on 5 year average).

Sapienza, University of Rome, Italy. *September 2004 – September 2007*
B.Sc. in Mathematics.

PUBLICATIONS, CONFERENCE PROCEEDINGS, PREPRINTS, THESES

Peer Reviewed Publications

1. Z. Zhang, A. Alla, G.E. Karniadakis. *Adjoint Method versus Physics-Informed Neural Networks in PDE-Constrained Inverse Problems*, Computer Methods in Applied Mechanics and Engineering, 464, 2027. http://doi.org/10.1016/j.cma.2026.119472

2. A. Alla, R. Geelen, H. Lu. *Efficient data-driven regression for reduced-order modeling of spatial pattern formation*, Journal of Computational Physics, **557**, 2026. https://doi.org/10.1016/j.jcp.2026.114815

3. A. Alla, A. De Luca, R. Folino, M. Strani. *Stability properties of solutions to convection-reaction equations with nonlinear diffusion.* Mathematics in Engineering, **7**, 535-585, 2025. https://doi.org/10.3934/mine.2025023

4. A. Alla, G. Bertaglia, E. Calzola. *A PINN Approach for the Online Identification and Control of Unknown PDEs.* J Optim Theory Appl **206**, 2025. https://doi.org/10.1007/s10957-025-02686-5

5. Mattia Reato, Beatrice Polido, Anna Bonfiglio, Giulia Moro, Vincent César, Stephane Bellemin-Leponnaz, Alessandro Alla, Neso Sojic, Matteo Mauro and Federico Polo, *Bright and stable electrochemiluminescence by heterobimetallic IrIII-MI (MI = CuI, AuI) complexes*, Adv. Optical Mater. **13** 2025. https://doi.org/10.1002/adom.202403430

6. A. Alla, M. Berardi, L. Saluzzi, *State Dependent Riccati for dynamic boundary control to optimize irrigation in Richards' Equation framework*, Mathematics and Computers in Simulation, **232**, 2025, 261-275. https://doi.org/10.1016/j.matcom.2024.12.020

7. A. Alla, A. Pacifico, *A POD approach to identify and control PDEs online through State Dependent Riccati equations,* Dyn Games Appl, 2024. https://doi.org/10.1007/s13235-024-00605-3

8. A. Alla, A. Pacifico, A. Pesare, M. Palladino, *Online identification and control of PDEs via Reinforcement Learning methods,* in Advances in Computational Mathematics **50**, 2024. https://doi.org/10.1007/s10444-024-10167-y

9. A. Alla, A. Monti, I. Sgura, *Piecewise DMD for oscillatory and Turing spatio-temporal dynamics,* Computers&Mathematics with applications, **160**, 2024, 108-124. https://doi.org/10.1016/j.camwa.2024.02.022

10. A. Alla, H. Oliveira, G. Santin, *HJB-RBF based approach for the control of PDEs*, Journal of Scientific Computing, **96**, 2023, 1-27. https://doi.org/10.1007/s10915-023-02208-3

11. A. Alla, M. D'Elia, C. Glusa, H. Oliveira, *Control of fractional diffusion problems via dynamic programming equations*, Journal of Peridynamics and Nonlocal Modeling, 2023. https://doi.org/10.1007/s42102-023-00101-z

12. A. Alla, A. Monti, I. Sgura, *Adaptive POD-DEIM correction for Turing pattern approximation in reaction-diffusion PDE systems*, Journal of Numerical Mathematics, **31**, 2023, 205–229. https://doi.org/10.1515/jnma-2022-0025

13. A. Alla, D. Kalise, V. Simoncini, *State-dependent Riccati equation feedback stabilization for nonlinear PDEs*, Advances in Computational Mathematics, **49**, 2023, 1-32. https://doi.org/10.1007/s10444-022-09998-4

14. L. Saluzzi, A. Alla, M. Falcone, *Error estimates for a tree structure algorithm solving finite horizon control problems*, ESAIM: COCV, **28**, 2022, 69. https://doi.org/10.1051/cocv/2022067

15. A. Alla, C. Graessle, M. Hinze, *Time adaptivity in Model Predictive Control*, Journal of Scientific Computing, **90**, 2022, 1-24. https://doi.org/10.1007/s10915-021-01647-0

16. A. Alla, M. Falcone, L. Saluzzi, *A tree structure algorithm for optimal control with state constraints*, Rendiconti di Matematica e delle sue Applicazioni, **41**, 2020, 193-221.

17. A. Alla, C. Balzotti, M. Briani, E. Cristiani, *Understanding Mass Transfer Directions via Data-Driven Models with Application to Mobile Phone Data*, SIAM J. Appl. Dyn. Syst., **19**, 2020, 1372–1391. https://doi.org/10.1137/19M1248479

18. A. Alla, B. Haasdonk, A. Schmidt, *Feedback control of parametrized PDEs via model order reduction and dynamic programming principle*, Advances in Computational Mathematics, **46**, 2020. https://doi.org/10.1007/s10444-020-09744-8

19. A. Alla, L. Saluzzi, *A HJB-POD approach for the control of nonlinear PDEs on a tree structure,* Applied Numerical Mathematics, **155**, 2020, 192-207. https://doi.org/10.1016/j.apnum.2019.11.023

20. A. Alla, M. Falcone, L. Saluzzi, *An efficient DP algorithm on a tree-structure for finite horizon optimal control problems*, SIAM J. Sci. Comput., **41**, 2019, A2384-A2406. https://doi.org/10.1137/18M1203900

21. M. Hess, A. Alla, A. Quaini, G. Rozza, M. Gunzburger. *A localized reduced-order modeling approach for PDEs with bifurcating solutions,* Computer Methods in Applied Mechanics and Engineering, **311**, 2019, 379-403. https://doi.org/10.1016/j.cma.2019.03.050

22. S. Rudy, A. Alla, S. Brunton, J.N. Kutz, *Data-driven identification of parametric partial differential equations*, SIAM J. Appl. Dyn. Syst., **18**, 2019, 643–660. https://doi.org/10.1137/18M1191944

23. A. Alla, J.N. Kutz. *Randomized Model Order Reduction*,Advances in Computational Mathematics, **45**, 2019, 1251-1271. https://doi.org/10.1007/s10444-018-09655-9

24. A. Alla, M. Hinze, P. Kolvenbach, O. Lass, S. Ulbrich, *A Certified Model Reduction Approach for Robust Parameter Optimization with PDE Constraints*, in Advances in Computational Mathematics, **45**, 2019, 1221-1250. https://doi.org/10.1007/s10444-018-9653-1

25. A. Alla, C. Graessle, M. Hinze. *A-posteriori snapshots location for POD in optimal control of linear parabolic equations*, ESAIM:M2AN, **52**, 2018, 1847-1873. https://doi.org/10.1051/m2an/2018009

26. A. Alla, M. Falcone, S. Volkwein. *Error analysis for POD approximations of infinite horizon problems via the dynamic programming approach,* SIAM J. Control Optim., **55**, 2017, 3091-3115. https://doi.org/10.1137/15M1039596

27. A. Alla, J.N. Kutz. *Nonlinear model order reduction via Dynamic Mode Decomposition,* SIAM J. Sci. Comput., **39**, 2017, 778-796. https://doi.org/10.1137/16M1059308

28. A. Alla, M. Falcone, D. Kalise. *A HJB-POD feedback synthesis approach for wave equation,* Bulletin of the Brazilian Mathematical Society, New Series, **47**, 2016, 51-64. https://doi.org/10.1007/s00574-016-0121-6

29. A. Alla, S. Volkwein. *Asymptotic Stability and Suboptimality of Model Predictive Control for semilinear PDEs,* in Advances in Computational Mathematics, Springer US, **41**, 2015, 1073-1102. https://doi.org/10.1007/s10444-014-9381-0

30. A. Alla, M. Falcone, D. Kalise. *An efficient Policy Iteration algorithm for dynamic programming equations,* SIAM J. Sci. Comput., **37**, 2015, 181-200. https://doi.org/10.1137/130932284

Submitted Papers

31. A. Alla, M. Herty, J. Liu, G. Puppo. *Modeling and optimization of financial networks mediated by a Central Counterparty using delay differential equations*, submitted to Mathematics and Computers in Simulation, 2026.

32. A. Alla, F. Mayer. *Linear error bounds for HJB equations in finite horizon control problems*, submitted to Communications on Applied Mathematics and Computation, 2026. https://arxiv.org/pdf/2602.15215

33. G. Albi, A. Alla, E. Calzola. *Discovery of interaction and diffusion kernels in particle-to-mean-field multi-agent systems*, submitted to SIAM Multiscale Modeling and Simulation, 2026. https://arxiv.org/pdf/2603.15927

Peer Reviewed Conference Proceedings

34. A. Alla, L. Saluzzi, *Feedback reconstruction techniques for optimal control problems on a tree structure*, in Eccomas 2022

35. A. Alla, P.M. Dower, V. Liu, *A tree structure approach to reachability analysis*, In: Albi, G., Boscheri, W., Zanella, M. (eds) Advances in Numerical Methods for Hyperbolic Balance Laws and Related Problems. YR 2021. SEMA SIMAI Springer Series, vol 32. Springer, Cham. https://doi.org/10.1007/978-3-031-29875-2_1

36. A. Alla, M. Falcone, L. Saluzzi, *High-order Approximation of the Finite Horizon Control Problem via a Tree Structure Algorithm*, in IFAC-PapersOnLine, **52**, 2019, 19-24.

37. A. Alla, V. Simoncini, *Order reduction approaches for the algebraic Riccati equation and the LQR problem,* In: Falcone M., Ferretti R., Grüne L., McEneaney W. (eds) Numerical Methods for Optimal Control Problems. Springer INdAM Series, **29**. Springer, Cham, 2019, 89-109.

38. J.N. Kutz, S. Rudy, A. Alla, S. Brunton *Data-driven discovery of governing physical laws and their parametric dependencies in engineering, physics and biology*, to appear in Conference Proceedings CAMSAP 2017.

39. A. Alla, G. Fabrini, M. Falcone. *A HJB-POD approach to the control of the level set equation,* In Benner P., Ohlberger M., Patera A., Rozza G., Urban K. (eds) Model Reduction of Parametrized Systems. MS&A (Modeling, Simulation and Applications), **17**. Springer, Cham, 2017, 317-331.

40. A. Alla, A. Schmidt, B. Haasdonk. *Model order reduction approaches for infinite horizon optimal control problems via the HJB equation,* In: Benner P., Ohlberger M., Patera A.,

Rozza G., Urban K. (eds) Model Reduction of Parametrized Systems. MS&A (Modeling, Simulation and Applications), **17**. Springer, Cham, 2017, 333-347.

41. A. Alla, U. Matthes. *Model order reduction for a linearized robust PDE constrained optimization,* in Conference Proceedings of the 2nd IFAC Conference on Control of Partial Differential Equations, **49**, 2016, 321-326.

42. A. Alla, C. Graessle, M. Hinze. *A residual based snapshot location strategy for POD in distributed optimal control of linear parabolic equations,* in Conference Proceedings of the 2nd Conference on Control of Partial Differential Equations, **49**, 2016, 13-18.

43. A. Alla, G. Fabrini, M. Falcone. *Coupling MPC and DP methods for an efficient solution of optimal control problems,* in System Modeling and Optimization, 27th IFIP TC 7 Conference, CSMO 2015, 68-77.

44. A. Alla, M. Hinze. *HJB-POD feeback control of advection-diffusion equation with a model predictive control snapshot sampling,* in Conference Proceedings of the 5th IFAC Conference on Nonlinear Model Predictive Control, **48**, 2015, 527-532.

45. A. Alla, M. Hinze, O. Lass, S. Ulbrich. *Model order reduction approaches for the optimal design of permanent magnets in electro-magnetic machines,* in Conference Proceedings MATHMOD **48**, 2015, 242-247.

46. A. Alla, M. Hinze. *HJB-POD feedback control for Navier-Stokes equations,* in Russo G., Capasso V., Nicosia G., Romano V. (eds) Progress in Industrial Mathematics at ECMI 2014. ECMI 2014. Mathematics in Industry, **22**. Springer, Cham, 2017, 861-868.

47. A. Alla, M. Falcone, D. Kalise. *An accelerated value/policy iteration scheme for the solution of DP equations,* Numerical Mathematics and Advanced Applications - ENUMATH 2013, LNCSE **103**, 2015, 489-497.

48. A. Alla, M. Falcone, D. Kalise. *An efficient Policy Iteration algorithm for dynamic programming equations,* PAMM, **37**, 2013, 467-468.

49. A. Alla, M. Falcone. *A time adaptive POD method for optimal control problems,* in Conference Proceedings of the 1st IFAC Conference on Control of Systems Governed by Partial Differential Equations, **1**, 2013, 245-250.

50. A. Alla, M. Falcone. *An adaptive POD approximation method for the control of advection-diffusion equations,* in Control and Optimization with PDE Constraints, K. Kunisch, K. Bredies, C. Clason, G. von Winckel (eds), International Series of Numerical Mathematics, **164**, Birkhäuser, Basel, 2013, 1-17.

Lecture Notes

51. A. Alla. *First Steps into Model Order Reduction,* Editora do IMPA, Rio de Janeiro, 2022. https://impa.br/wp-content/uploads/2022/03/33CBM12-eBook.pdf

Phd Thesis

52. A. Alla. *Model Reduction for a Dynamic Programming Approach to optimal control problems with PDE constraints,* PhD Thesis, 2014.

HONORS AND AWARDS

National Scientific Habilitation. Italian habilitation to the role of Full professor. Valid from the 09/07/2025 till 09/07/2037.

Scuola Superiore di Studi Avanzati Sapienza Junior Research Fellows 2025-2028.

ICIAM 2023. Financial support to attend the conference.

GNCS support for attending workshops in 2023

Overseas Mobility Program. Financed by Università Ca' Foscari Venezia.

Research Awards Young Investigator Training Programm. Financed by Associazione di Fondazioni e Casse di Risparmio S.p.A, 2021.

Jovem Cientista de Nosso Estado. Research grant from FAPERJ, 2021-2024. (PI Alessandro Alla)

National Scientific Habilitation. Italian habilitation to the role of Associate professor. Valid from the 09/11/2020 till 09/11/2029.

Bolsas de Produtividade em Pesquisa. Research grant from CNPq, 2019-2022. (PI Alessandro Alla)

Bolsa PUC de Produtividade em Pesquisa. Research grant from PUC-Rio, 2018-2022. (PI Alessandro Alla)

Brazilian-French Network in Mathematics. Financial Support for a research visit of Dr. Adriano Festa at PUC-Rio, 2018.

IMPA, Rio de Janeiro, Brazil. Financial support to attend the conference HYP2014, 2014.

European Science Foundation (ESF). Stipend for a three-month long research visit at the University of Konstanz, Germany. Grant n. 4160, 2013.

University of Seville. Stipend for a four-month research visit at the University of Seville, Spain, 2010.

Sapienza, University of Rome, Italy. Fellowship *Master's thesis abroad.* Stipend for a two-month research visit at Karl Franzens University of Graz, Austria, 2009.

European Region Action Scheme for the Mobility of University Students. Erasmus stipend exchange student for a six-month visit at Karl Franzens University of Graz, Austria, 2008.

RESEARCH PROJECTS

Progetto Ateneo 2025. *Bridging Analysis and Computation in Evolutionary PDEs*
(PI: Prof. Alessandro Alla)

GNCS Research Project 2024. *New numerical methods for Hamilton-Jacobi equations.*
(PI: Prof. Alessandro Alla)

PRIN PNRR 2022. *Data-driven discovery and control of multi-scale interacting artificial agent systems.* (PI Prof. Giacomo Albi, local PI in Venice: Prof. Alessandro Alla)

Jovem Cientista de Nosso Estado, FAPERJ. *Análise numérica em controle ótimo para equações diferenciais parciais* (PI Prof. Alessandro Alla)

Bolsa de Produtividade, CNPq. *Modelagem com redução de ordem em controle ótimo* (PI Prof. Alessandro Alla)

Petrobras. *Mathematical and computational modeling of related problems on injectivity tests in vertical and horizontal wells considering multilayers reservations* (PI Prof. Sinesio Pesco)

Bolsa de Produtividade, PUC *Análise numérica em controle ótimo para equações diferenciais parciais* (PI Prof. Alessandro Alla)

Department of Energy *DiaMonD: An Integrated Multifaceted Approach to Mathematics at the Interfaces of Data, Models, and Decisions* (PI Prof. Max Gunzburger)

BMBF *SIMUROM* (PI Prof. Sebastian Schöps)

Progetto Ateneo 2010. *Analisi ed approssimazione di modelli differenziali nonlineari in fluidodinamica e scienza dei materiali* (PI Prof. Maurizio Falcone)

PRIN 2009. *Numerical modelling for scientific computing and advanced applications* (PI Prof. Alfio Quarteroni)

STUDENT SUPERVISION

PhD Student

- Filippo Mayer, (PhD in Mathematics, Sapienza, Università di Roma), ongoing.
- Agnese Pacifico, (PhD in Mathematics, Sapienza, Università di Roma). *Identification and control of unknown differential equations*, February 2025.
- Angela Monti, (PhD in Mathematics and Informatics, Università del Salento, co-advisor with Prof. Ivonne Sgura). *Model reduction and data-driven techniques for spatio–temporal dynamics of Turing and oscillatory type*, September 2023.
- Hugo Souza Oliveira, (PhD in Mathematics, PUC-Rio, Brazil) A RBF approach to the control of PDES using Dynamic Programming equations, September 2022.

Master Student

- Sofia Mari. *Operator Inference*, ongoing
- Agnese Lorelli. *POD for Turing patterns*, October 2026.
- Filippo Mayer. *The HJB-POD method*, October 2025.
- Beatrice D'Agostino. *Pod method for pattern formation with chemotaxis*, September 2025.
- Eleonora Giansante. *Model order reduction for parametric HJB equations*, March 2025.
- Iago Arcas da Fonseca. *Applications of heat equation in oil industry*, September 2020.

Bachelor Student

- Francesco Marini. *Montecarlo methods for numerical integration*, ongoing.
- Alessio Di Bona. *Matlab implementation of PINNs*, December 2025.

- Giulia Grossi. *A numerical scheme for the approximation of Turing pattern*, September 2025.
- Giulia Postinghel. *Multi-linear approximation: theoretical and computational aspects*, July 2025.
- Alessandro Crotti. *PINNS for PDEs*, March 2024.
- Stefano Falcone. *A Semi-Lagrangian scheme for optimal control problem*, October 2023.

Iniciação Cientifica

- Breno Pereira. *FEniCs for nonlinear PDEs*, August 2019.
- Jerônimo Augusto Soares. *Numerical optimization*, August 2020.

Research in Action

- Tutoring a group of students of the fourth year from *Liceo Scientifico G.B. Grassi* (Latina, Italy) under the project PCTO.

ACADEMIC VISITS

Brown University, USA. Februrary 2026
Visiting Prof. George Karniadakis.

The University of Melbourne, Australia. February 2024 – March 2024
Visiting Prof. Peter M. Dower.

PUC-Rio, Brazil. February 2023 – March 2023
Visiting Prof. Carlos Tomei.

The University of Melbourne, Australia. September 2022
Visiting Prof. Peter M. Dower.

IAC-CNR, Italy. June 2021
Visiting Dr. Emiliano Cristiani.

The University of Hong Kong, China. *January 2019–February 2019*
Visiting Professor Zheng Qu.

University of Washington. *April 2017*
Visiting Professor J. Nathan Kutz.

University of Washington. *April 2016*
Visiting Professor J. Nathan Kutz.

University of Konstanz, Germany. *January 2013 – May 2013*
Visiting Professor Stefan Volkwein.

University of Seville, Spain. *March 2010 – June 2010*
Post grauduate intensive course: *Construnctive Approximation, Optimization and Mathematical Modelling.*

Karl Franzens University of Graz, Austria. *April 2009 – May 2009*
Visiting Professor Karl Kunisch.

Karl Franzens University of Graz, Austria. *February 2009–July 2008*
Erasmus Exchange Project.

CONFERENCES, SEMINARS, GIVEN TALKS

Invited Conference Talks

Datahyking, Rome, Italy *September 2026*
Towards Feedback Control of Hyperbolic PDEs via Dynamic Programming and Calibrated Model Reduction

Advanced numerical methods for Real-world Applications, Bari, Italy *June 2026*
Learning pattern formation in reaction–diffusion systems (**plenary speaker)**

Hike-LABS, Canazei, Italy *September 2025*
Data-driven polynomial reduced order modeling for pattern formation

Carlos Tomei setenta anos, Rio de Janeiro, Brazil *August 2025*
Efficient data-driven regression for reduced order modeling of spatial pattern formation

Trends in mathematical collaborations between Brazil and Italy, Rome, Italy *June 2025*
Data-Driven Algorithms for Online Identification and Control of PDEs

Mathematics for ML: Applications to PDEs and Related Fields, Ferrara, Italy *March 2025*
Data-Driven Algorithms for Online Identification and Control of PDEs

Joint Workshop AMS-UMI, Palermo, Italy *July 2024*
Low rank methods for Turing pattern approximation in reaction-diffusion PDE systems

Numerical Analysis in Veneto, Venezia, Italy *May 2024*
An efficient online algorithm to identify and control unknown Partial Differential Equations

Maurizio day: numerics for controls, pdes and images, Rome, Italy *December 2023*
A POD based approach to identify and control PDEs

ICIAM 2023, Tokyo, Japan *August 2023*
Online identification and control of PDEs via Reinforcement Learning methods

Nonlinear PDEs: theory, numerics and applications, Rome, Italy *May 2023*
Online identification and control of PDEs via Reinforcement Learning methods

Theory and numeric of MFG and HJ equations, Rome, Italy *June 2022*
HJB-RBF based approach for the control of PDEs

Numerical aspects of hyperbolic laws and related problems, Verona, Italy *December 2021*
HJB-RBF based approach for the control of PDEs

Simai 2020+2021 (MS ACRI-YITP), Parma, Italy *August 2021*
Discovery mathematical models from experimental data

Workshop on Optimal Control and Mean Field Games, Rio de Janeiro, Brazil *October 2019*
A HJB-POD approach for the control of nonlinear PDEs on a tree structure

3^{rd} AFOSR WS Computational Issues in Nonlinear Control, Monterey, USA *October 2019*
A Dynamic Programming approach on a tree structure for finite horizon optimal control problems

3^{rd} IFAC Workshop on Control of Systems Modeled by PDEs, Oaxaca, Mexico *May 2019*
High-order Approximation of the Finite Horizon Control Problem via a Tree Structure Algorithm

VI Latin American Workshop on Optimization and Control, Quito, Ecuador *September 2018*
Numerical approximation of feedback control for PDEs via Dynamic Programming

14^{th} Conference on Optimal Control and Dynamic Games, Vienna, Austria *July 2018*
Basis generation for feedback control problems

Data-Driven methods for Multi-Scale Physics and Complex Systems, Rome, Italy *August 2017*
DMD-Galerkin Approximation for nonlinear dynamical system

SIAM Conference on Computational Science, Atlanta, USA *March 2017*
Nonlinear Model Order Reduction via Dynamic Mode Decomposition

Data-Driven Methods for ROM and Stochastic PDEs, Banff, Canada. *January 2017*
Randomized Model Order Reduction.

Optimal Control of Partial and Ordinary Differential Equations, Paris, France. *November 2015*
Optimal snapshot location for POD model reduction in optimal control.

SIAM Conference on Control and its Applications, Paris, France. *July 2015*
A POD-MOR approach for robust optimal control with PDE constraints.

From Open Loop to Closed Loop control, Graz, Austria. *June 2015*
On the stabilization of feedback controls in a dynamic programming framework.

SIAM Conference on Computational Science, Salt Lake City, USA. *March 2015*
HJB-POD feedback control for advection-diffusion equations.

Mathmod, Vienna, Austria. *February 2015*
Model order reduction approaches for the optimal design of permanent magnets in electromagnetic machines.

18th European Conference on Mathematics for Industry (ECMI), Taormina, Italy. *June 2014*
HJB-POD feedback control for Navier-Stokes equations.

1st IFAC Workshop on Control of Systems Modeled by PDEs, Paris, France. *September 2013*
A Time-Adaptive POD Method for the Optimal Control Problems.

Modeling and Control of Large Interacting Dynamical Systems, Paris, France. *September 2013*
Asymptotic Stability and Suboptimality of Model Predictive Control for Semilinear PDEs.

Model Reduction and Approximation for Complex Systems, Luminy, France. *June 2013*
Asymptotic Stability and Suboptimality of Model Predictive Control for Semilinear PDEs.

Contributed Conference Talks

LAWOC2026, Rio de Janeiro, Brazil *July 2026*
Towards Feedback Control of Hyperbolic PDEs via Dynamic Programming and Calibrated Model Reduction

GAMM-ANLA, Bologna, Italy *October 2025*
Data-Driven polynomial reduced order modeling of spatial pattern formation

Hidden structures in dynamical systems, optimization, and ML, L'Aquila, Italy *May 2025*
Data-Driven Algorithms for Online Identification and Control of PDEs

Numerical methods for OCPs: algorithms, analysis and applications, Rome, Italy. June 2017
Model order reduction for the control of parametrized PDEs via dynamic programming.

4th Workshop on Sparse Grids and Applications, Miami, USA. October 2016
Nonlinear Model Reduction via Dynamic Mode Decomposition.

2nd IFAC Workshop on Control of Systems Governed by PDEs, Bertinoro, Italy. *June 2016*
Model order reduction for a linearized robust PDE constrained optimization.

36th NoKo, Bremen, Germany. *April 2015*
On the coupling between MPC and DP methods for optimal control problems.

XV International Conference on Hyperbolic Problems, Rio De Janeiro, Brazil. July 2014
HJB-POD feedback control for Navier-Stokes equations.

Recent trends in Computational Science and Engineering, Plön, Germany. *March 2014*
HJB-POD feedback control for Navier-Stokes equations.

84th GAMM Annual Meeting, Novi Sad, Serbia. *March 2013*
An adaptive POD approximation method for the control of evolutive equations.

Adaptivity and MOR in PDE Constrained Optimization, Hamburg, Germany. *July 2012*
An adaptive POD approximation method for the control of advection-diffusions equation.

Summer School on Optimal Control of Partial Differential Equations, Cortona, Italy. *July 2010*
Optimal control problems for PDEs via POD and HJB.

Seminars

Seminari di Analisi Numerica, Università di Bologna, Italy *May 2022*
An online algorithm to identify and control unknown Partial Differential Equations
Invited by Prof. Valeria Simoncini

CSP Seminar, The university of Melbourne, Australia. *February 2024*
An online algorithm to identify and control unknown Partial Differential Equations
Invited by Prof. Peter Dower

Seminarios de engenharia e ciencia computacional, UFRJ, Brazil *March 2023*
Low rank methods for Turing pattern approximation in reaction-diffusion PDE systems
Invited by Prof. Alvaro Coutinho

Seminari di Analisi Numerica, Università di Bologna, Italy *November 2022*
Low rank methods for Turing pattern approximation in reaction-diffusion PDE systems
Invited by Prof. Valeria Simoncini

Seminari di Analisi Numerica del Disma, Politecnico di Torino, Italy *November 2022*
Adaptive POD-DEIM correction for Turing pattern approximation in RD-PDE systems
Invited by Prof. Adriano Festa

"Differential Equations and Applications", Università di Padova, Italy. *November 2022*
Recent algorithms towards the control of PDEs via dynamic programming equations
Invited by Prof. Daniela Tonon and Marco Cirant

CSP Seminar, The university of Melbourne, Australia. *September 2022*
Recent algorithms towards the control of PDEs via dynamic programming equations
Invited by Prof. Peter Dower

Oberseminar "Numerical Optimization", University of Konstanz, Germany *May 2022*
Adaptive POD-DEIM correction for Turing pattern approximation in RD-PDE systems
Invited by Prof. Stefan Volkwein

Seminari di Modellistica Numerica, Sapienza University of Rome, Italy *December 2021*
HJB-RBF based approach for the control of PDEs
Invited by Prof. Maurizio Falcone

Computational Methods in Systems and Control Theory, MPI, 2021. *June 2021*
Recent advances in suboptimal feedback control for PDEs
Invited by CSC seminar organizers

Control in Times of Crisis. Online seminar *May 2021*
HJB-RBF based approach for the control of PDEs
Invited by Luz de Teresa, Sylvain Ervedoza, Enrique Fernández Cara, Alberto Mercado Saucedo

Palestra - Verão 2021, UFPB, Brazil *March 2021*
Análise numérica em controle ótimo para equações diferenciais parciais
Invited by Prof. Mauricio Cardoso Santos

CASA Colloquium, TU Eindhoven, Netherlands *September 2020*
A discrete time Dynamic Programming approach on a tree for finite horizon optimal control problems
Invited by Prof. Laura Iapichino

GFDI Colloquium, FSU, USA *April 2019*
Discovery mathematical models from experimental data
Invited by Prof. Kevin Spear.

Scientific Computing Colloquium, Department of Scientific Computing, FSU, USA April 2019
A DP approach on a tree structure for finite horizon optimal control problems
Invited by Prof. Bryan Quaife.

Computational Science Seminar, The University of Hong Kong, China. *January 2019*
Discovery mathematical models from experimental data.
Invited by Prof. Zheng Qu.

Computational Science Seminar, The University of Hong Kong, China. *January 2019*
A DP approach on a tree structure for finite horizon optimal control problems.
Invited by Prof. Zheng Qu.

Seminari di Modellistica Numerica, Sapienza University of Rome, Italy. *December 2018*
Discovery mathematical models from experimental data.
Invited by Prof. Maurizio Falcone.

IMPA, Rio De Janeiro, Brazil April 2017
Model order reduction for large-scale problem with applications to PDE constrained optimization.
Invited by Prof. A. Nachbin.

PUC-Rio Seminario q.t.p., Rio de Janeiro, Brazil March 2017
Feedback control for PDEs.
Invited by Prof. L. Diaz.

University of Washington Colloquium, Seattle, USA *April 2017*
Model order reduction for the control of PDEs via dynamic programming
Invited by Prof. J. Nathan Kutz.

Scientific Computing Colloquium, FSU, USA. *September 2016*
The HJB-POD approach for infinite dimensional control problems.
Invited by Prof. Max Gunzburger.

Seminari di Modellistica Numerica, Sapienza University of Rome, Italy. *February 2016*
Nonlinear Model Reduction via Dynamic Mode Decomposition.
Invited by Prof. Maurizio Falcone.

Lothar-Collatz Seminar, Hamburg, Germany. *January 2016*
Nonlinear Model Reduction via Dynamic Mode Decomposition.
Invited by Lothar-Collatz Center.

SimTech MOR-Seminar, Stuttgart, Germany. *December 2015*
Model order reduction for infinite horizon optimal control problems via the dynamic programming principle.
Invited by Prof. Bernard Haasdonk.

Seminari di Modellistica Numerica, Sapienza University of Rome, Italy. *March 2015*
Optimization and Model Reduction for a permament magnet.
Invited by Prof. Maurizio Falcone.

Group Seminar, RICAM, Linz, Austria. *February 2015*
On the coupling between MPC and DP methods for optimal control problems.
Invited by Dr. Dante Kalise and Prof. Karl Kunisch.

Lothar-Collatz Seminar, Hamburg, Germany. *April 2014*
Model Reduction for a Dynamic Programming Approach to optimal control problems with PDE constraints.
Invited by Lothar-Collatz Center.

Seminari di Modellistica Numerica, Sapienza University of Rome, Italy. *November 2013*
Model Reduction for a Dynamic Programming Approach to optimal control problems with PDE constraints.
Invited by Prof. Maurizio Falcone.

Kolloquium, Constance, Germany. *September 2012*
An adaptive POD approximation method for the control of advection-diffusions equation.
Invited by Prof. Stefan Volkwein.

Seminari di Modellistica Numerica, Sapienza University of Rome, Italy. *February 2010*
POD Method and reduced order model.
Invited by Prof. Maurizio Falcone.

Poster Session

More 2024, Model Reduction and Surrogate Modeling, San Diego, USA. *September 2024*
An online algorithm to identify and control unknown PDEs

MoRePas 2018, Model Reduction of Parametrized Systems IV, Nantes, France. *April 2017*
Basis generations for feedback control problems.

Optimal Control of Partial and Ordinary Differential Equations, Paris, France. *November 2015*
A POD-MOR approach for robust optimal control with PDE constraints.

MoRePas 2015, Model Reduction of Parametrized Systems III, Trieste, Italy. *October 2015*
A POD-MOR approach for robust optimal control with PDE constraints.

5th IFAC Conference on Nonlinear Model Predictive Control, Seville, Spain. *September 2015*
HJB-POD feeback control of advection-diffusion equation with a Model Predictive Control snapshot sampling.

New trends on optimal control, Torus, France. *June 2014*
MPC initialization for Bellman equations.

Scientific Divulgation

Meeting with the students of *Liceo Scientifico G.B. Grassi*, Latina, Italia. *December 2018*
La matematica e le sue applicazioni: un mestiere moderno.

Meeting with the students of *Liceo Scientifico G.B. Grassi*, Latina, Italia. *June 2017*
La matematica (non) sará il mio mestiere.

Meeting with the students of *Liceo Scientifico G.B. Grassi*, Latina, Italia. *March 2015*
Controllo ottimo di equazioni differenziali.

TEACHING EXPERIENCE

Lecturer at Sapienza, University of Rome, Italy
Calculus 1 for Chemestry. *Fall 2026*
Model reduction for parametric PDEs (for students in the excellence program). Spring 2026
Numerical methods, Department of Mathematics. Spring 2026
Data Mining, Department of Mathematics *Spring 2026*
Calculus 2 for Informatics. *Fall 2025*
Calculus 2 for Informatics. *Fall 2024*
Programming and Computing Laboratory, Department of Mathematics. *Fall 2024*
Numerical methods, Department of Mathematics. Spring 2025
Operator inference (for students in the excellence program). Spring 2025

Lecturer at University of Melbourne, Australia. (PhD course)
NUMerical approximation for Optimal feedback Control. February 2024

Lecturer at Summer School SDS2022, Italy.https://sds2022.wordpress.com/
Model order reduction for ODEs and PDEs and (some) applications. June 2022

Lecturer at University Ca' Foscari Venezia, Italy.
Numerical Methods for Engineering physics. *Fall 2023*
Linear Algebra for Engineering physics. *Fall 2023*
Calculus 0 for for Engineering physics. *Fall 2023*
Calculus 2 for Chemestry. Fall 2022
Numerical Methods for Engineering physics. *Fall 2022*
Linear Algebra for Engineering physics. *Fall 2022*
Linear Algebra for Engineering physics. *Spring 2022*

Lecturer at IMPA, Rio de Janeiro, Brazil. (PhD course)
First steps into model order reduction, 33rd CBM. *August 2021*

Lecturer at Sapienza University of Rome, Italy. (PhD course)
Model order reduction for PDEs, Department SBAI. *Fall 2020*

Lecturer at The University of Hong Kong, China. (PhD course)
Model order reduction for dynamical systems, Department of Mathematics. *Fall 2019*

Lecturer at PUC-Rio, Brazil.
Calculus 2, Department of Mathematics. *Fall 2021*
Numerical Methods for ODEs, Department of Mathematics. *Fall 2021*
Calculus 2, Department of Mathematics. *Spring 2021*
Numerical Linear Algebra, Department of Mathematics. *Spring 2021*
Calculus 4, Department of Mathematics. *Fall 2020*
Numerical Methods for ODEs, Department of Mathematics. *Fall 2020*
Calculus 4, Department of Mathematics. *Spring 2020*
Numerical Methods for PDEs, Department of Mathematics. *Spring 2020*
Calculus 4, Department of Mathematics. *Fall 2019*
Numerical Methods for ODEs, Department of Mathematics. *Fall 2019*
Numerical Linear Algebra, Department of Mathematics. *Spring 2019*
Introduction to Matlab, Department of Mathematics. *Spring 2019*
Nonlinear Numerical Analysis, Department of Mathematics. *Fall 2018*
Numerical Methods for ODEs, Department of Mathematics. *Fall 2018*
Numerical Linear Algebra, Department of Mathematics. *Spring 2018*
Introduction to Matlab, Department of Mathematics. *Spring 2018*
Topics of Applied Mathematics, Department of Mathematics. *Fall 2017*

Teaching Assistant at Florida State University, USA.
Finite Element, Department of Scientific Computing. *Fall 2016*

Lecturer at University of Hamburg, Germany.
Model Reduction, Department of Mathematics. *Fall 2015*

Teaching Assistant at University of Hamburg, Germany.
Model Reduction, Department of Mathematics. *Fall 2015*
Model Reduction, Department of Mathematics. *Fall 2014*

Teaching Assistant at Sapienza, University of Rome, Italy.
Programming and Computing Laboratory, Department of Mathematics. *Fall 2013*
Calculus I, Department of Engineering. *Fall 2013*
Programming and Computing Laboratory, Department of Mathematics. *Fall 2012*
Numerical Analysis, Department of Mathematics. *Spring 2011*
Programming and Computing Laboratory, Department of Mathematics. *Fall 2011*
Calculus I, Department of Aerospatial Engineering. *Fall 2010*
Calculus II, Department of Aerospatial Engineering. *Fall 2010*
Calculus I, Department of Chemistry. *Fall 2010*

SOCIETY MEMBERSHIPS

GNCS. Member of the National Group of Scientific Computing (GNCS) for the following years: 2013, 2014, 2015, 2022, 2023, 2024, 2025, and 2026.

ACADEMIC SERVICE

Referee per Acta Applicandae Mathematicae (ACAP), American Control Conference, Advances in Computational Mathematics, Annual Reviews in Control, Computer Methods in Applied Mechanics and Engineering, , ESAIM Control, Optimization and Calcolus of Variations, IFAC Journals, Journal of Guidance Control and and Dynamics, Mathematical Control and Related Fields, Mathematics and Computers in Simulation, Numerische Mathematik, SIAM Journal in Optimization and Control, SIAM Journal on Scientific Computing, Journal of Computational Physics, Journal of Scientific Computing, Communications in Nonlinear Science and Numerical Simulation.

Reviewer for the PhD thesis of Hudson Cavalcante Da Silva *Controlabilidade e observabilidade de sistemas acopladoes de EDPs: Boussinesq e Termoelasticidade*, Universidade Federal da Paraiba, Brazil.

Reviewer for the PhD thesis of Ramona Rubini *Manufacturing Sustainability through Cyber-Physical Systems*, Università di Bari, Italy.

Reviewer for the PhD thesis of Amine Saibi *Reinforcement Learning and Data-Driven Control of Fluid Flows*, Sorbonne University.

Referee for the Research Grants Council, Hong Kong since 2023, DFG grant proposal, CNPq proposal, Austrian Science Fund (FWF)

Member of the "Structuring Teaching Nucleus" in the Department of Mathematics at the Pontifical Catholic University of Rio de Janeiro for the academic years 2019/2020 and 2020/2021.

Member of the "Teaching Staff" for the bachelor course Environmental Engineering for the Ecological Transition at Università Ca' Foscari Venice for the academic year 2023/2024.

Member of "Giunta di Dipartimento" for the Department of Mathematics, Sapienza University of Rome (Italy) since November 2024.

Member of "Giunta di Facoltà" for the Department of Mathematics, Sapienza University of Rome (Italy) since November 2024.

Minisymposium organizer for the 2015 SIAM Conference on Control and its Applications, the 2017 SIAM Conference on Computational Science and Engineering, and the 2017 SIAM Conference on Control and its Applications.

Organizer of OktoberMat 2019 and 2020.

Local organizer of Workshop on Optimal Control and mean field games at FGV, Rio de Janeiro, Brazil 2019.

Organizer of the workshop *M day II: numerics for controls, pdes and images,* Dec. 2023, Rome, Italy
https://www1.mat.uniroma1.it/ricerca/convegni/2023/Mday/

Organizer of the Summer School *Machine Learning and Optimal Control*, Gaeta, May 2024.
https://sites.google.com/view/mloc2024/home

Organizer of the workshop *New trends in optimal control,* Venice, May 2024.
https://warwick.ac.uk/fac/sci/maths/research/events/2023-2024/venicecontrol2024

Organizer of the workshop *Numerical Analysis in Veneto*, Venice, May 2024.
https://www.unive.it/data/16437/1/86034

Organizer spacial session *Exploiting Low-rank structures for the solution of PDEs* at the joint meeting UMI-AMS 2024, Palermo, Italy
https://umi.dm.unibo.it/jm-umi-ams/special-sessions/special-sessions-on-25-26-july-2024/

Organizer of the workshop *M day: numerics for controls, pdes and images,* November 2024, Rome, Italy
https://sites.google.com/mat.uniroma1.it/mday2/home

Organizer of the school *Numerical method for high dimensional data*, Sept 2025, Rome, Italy
https://sites.google.com/uniroma1.it/numerics-high-dimensional-data/home

Organizer of the workshop *Optimal control and agent systems*, September 2025, Rome, Italy
https://sites.google.com/uniroma1.it/optimalcontrolagentsystem/home

Organizer of the school *Pattern Formation: Analysis and numerics*, Sept 2026, Rome, Italy
https://sites.google.com/uniroma1.it/pattern-formation/home

Organizer of the workshop *Advances in low rank and model reduction methods for PDEs*, November 2026, Rome, Italy
https://sites.google.com/uniroma1.it/wsmor/home

Organizer special session *Machine Learning for numerical methods in PDEs* at the 2nd joint meeting Brazil-Italy in Mathematics, September, 2026, Messina, Italy
https://umi.dm.unibo.it/jm-ita-bra-2026/special-sessions/special-session-27/

COMPUTER SKILLS

C++, FEniCS, LaTeX, Linux, Mac OS X, Matlab, Microsoft Windows, OpenOffice.

LANGUAGES

Italian: Native Speaker
English: Fluent
Portuguese: Upper Intermediate
Spanish: Elementary

Roma, 02/11/2026

Tutto quanto dichiarato nel presente curriculum vitae corrisponde a verità ai sensi degli articoli 46 e 47 del D.P.R. 445/2000.