Curriculum Vitae

Personal data and contacts

Name	Gabriele Santin
Citizenship	Italian
Affiliation	Department of Environmental Sciences, Informatics and Statistics, Ca' Foscari University of Venice
Address	Campus Scientifico, via Torino 155, 30172 Mestre (VE), Italy
Email	gabriele.santin@unive.it
ORCID	orcid.org/0000-0001-6959-1070

Professional experience

Since 09/2023	Assistant Professor, Department of Environmental Sciences, Informatics and Statistics, Ca' Foscari University of Venice, Italy
09/2019-08/2023	Researcher, Digital Society Center, Fondazione Bruno Kessler, Trento, Italy Research unit *Mobile and Social Computing*, B. Lepri. From 09/2019 to 09/2021: Level R4 researcher. From 09/2021: Level R3 researcher.
Since 12/2020	Associated member, Cluster of Excellence *Data-integrated Simulation Science* (SimTech), Univ. of Stuttgart, Germany Project Network *Machine Learning for Simulation*
10/2018-12/2020	Junior Participating Researcher, Cluster of Excellence *Data-integrated Simulation Science* (SimTech), Univ. of Stuttgart, Germany Project Network *Machine Learning for Simulation*
11/2015–09/2019	PostDoc (Teaching/Research Assist.), Inst. of Applied Analysis and Numerical Simulation, University of Stuttgart, Germany Research group *Numerical Mathematics*, B. Haasdonk
01/2013–10/2015	PhD student in Computational Mathematics, Doctoral School in Mathematical Sciences, University of Padova, Italy Research group *Constructive Approximation and Applications*, S. De Marchi

Education and qualifications

06/2022	Habilitation in Numerical Analysis, Italian national scientific qualification as Associate Professor, disciplinary field of 01/A5 - Numerical Analysis (Academic Recruitment Field 01/A - Mathematics).
01/2013–03/2016	PhD in Computational Mathematics, Doctoral School in Mathematical Sciences, University of Padova Thesis: Approximation in kernel-based spaces, optimal subspaces and approximation of eigenfunctions Advisors: Prof. S. De Marchi, Prof. R. Schaback (University of Göttingen, Germany) Defense date: Padova, 18/03/2016
10/2009–07/2012	Master's Degree in Mathematics (Laurea Magistrale in Matematica), University of Padova Thesis: A new stable basis for Radial Basis Function approximation Advisor: Prof. S. De Marchi.
10/2006–10/2009	Bachelor's Degree in Mathematics (Laurea Triennale in Matematica), University of Padova Thesis: Algebraic cubature on general domains by the software system Chebfun (in Italian) Advisors: Prof. A. Sommariva, Prof. M. Vianello.

Publications

Submitted . . . .

[51] B. Haasdonk, G. Santin, T. Wenzel,, *Kernel-based Greedy Approximation of Parametric Elliptic Boundary Value Problems*, (2025).
https://arxiv.org/abs/2507.06731

[50] M. Rama, G. Santin, G. Cencetti, M. Tizzoni, B. Lepri, *Forecasting Seasonal Influenza Epidemics with Physics-Informed Neural Networks*, (2025).
https://arxiv.org/abs/2506.03897

[49] L. Pastrello, D. Cecchin, G. Santin, F. Marchetti, *Tuning Butterworth filter's parameters in SPECT reconstructions via kernel-based Bayesian optimization with a no-reference image evaluation metric*, (2025).
https://arxiv.org/abs/2505.06692

[48] T. Karvonen, G. Santin, T. Wenzel, *General superconvergence for kernel-based approximation*, (2025).
https://arxiv.org/abs/2505.11435

Accepted . . . .

[47] M. Pacini, G. Santin, B. Lepri, S. Trivedi, *On Universality Classes of Equivariant Networks*, The Thirty-Ninth Annual Conference on Neural Information Processing Systems (NeurIPS2025) (2025).
https://arxiv.org/abs/2506.02293

Published . . . .

[46] T. Wenzel, G. Santin, B. Haasdonk, *Analysis of Structured Deep Kernel Networks*, ournal of Computational and Applied Mathematics (2025).
https://doi.org/10.1016/j.cam.2025.116975

[45] R. Campagna, S. Crisci, G. Santin, G. Toraldo, M. Viola, *An algorithm for a constrained P-spline*, BIT (2025).
https://doi.org/10.1007/s10543-025-01071-y

[44] J. Lee, B. Hamzi, B. Hou, H. Owhadi, G. Santin, U. Vaidya, *Kernel Methods for the Approximation of the Eigenfunctions of the Koopman Operator*, Physica D: Nonlinear Phenomena (2025).
https://doi.org/10.1016/j.physd.2025.134662

[43] T. Wenzel, D. Winkle, G. Santin, B. Haasdonk, *Adaptive meshfree approximation for linear elliptic partial differential equations with PDE-greedy kernel methods*, BIT (2025).
http://dx.doi.org/10.1007/s10543-025-01053-0

[42] M. Pacini, X. Dong, B. Lepri, G. Santin, *Separation Power of Equivariant Neural Networks*, The Thirteenth International Conference on Learning Representations (ICLR 2025) (2025).
https://openreview.net/forum?id=RAyRXQjsFl

[41] A. Longa, S. Azzolin, G. Santin, G. Cencetti, P. Liò, B. Lepri, A. Passerini, *Explaining the Explainers in Graph Neural Networks: a Comparative Study*, ACM Computing Surveys (2024).
https://doi.org/10.1145/3696444

[40] G. Santin, T. Wenzel, B. Haasdonk, *On the optimality of target-data-dependent kernel greedy interpolation in Sobolev Reproducing Kernel Hilbert Spaces*, SIAM Journal on Numerical Analysis (2024).
https://doi.org/10.1137/23M1587956

[39] T. Wenzel, G. Santin, B. Haasdonk, *Stability of convergence rates: Kernel interpolation on non-Lipschitz domains*, IMA Journal of Numerical Analysis (2024).
https://doi.org/10.1093/imanum/drae014

[38] L. Ferrarotti, M. Luca, G. Santin, G. Previati, G. Mastinu, E. Campi, L. Uccello, A. Albanese, P. Zalaya, A. Roccasalva, B. Lepri, *Autonomous and Human-Driven Vehicles Interacting in a Roundabout: A Quantitative and Qualitative Evaluation*, IEEE Access (2024).
https://doi.org/10.1109/ACCESS.2024.3370469

[37] M. Pacini, X. Dong, B. Lepri, G. Santin, *A Characterization Theorem for Equivariant Networks with Point-wise Activations*, The Twelfth International Conference on Learning Representations (ICLR2024) (2024).
https://openreview.net/forum?id=79FVDdfoSR

[36] M. Hammer, T. Wenzel, G. Santin, L. Meszaros-Beller, J. Paige Little, B. Haasdonk, S. Schmitt, *A new method to design energy-conserving surrogate models for the coupled, non-linear responses of intervertebral discs*, Biomechanics and Modeling in Mechanobiology (2024).
https://doi.org/10.1007/s10237-023-01804-4

[35] G. Cencetti, L. Lucchini, G. Santin, F. Battiston, E. Moro, A. Pentland, B. Lepri, *Temporal clustering of social interactions trades-off disease spreading and knowledge diffusion*, Journal of the Royal Society Interface (2024).
https://doi.org/10.1098/rsif.2023.0471

[34] M. Pacini, X. Dong, B. Lepri, G. Santin, *Point-wise Activations and Steerable Convolutional Network*, The Second Learning on Graphs Conference (2023).
https://openreview.net/forum?id=gsJPYzdA0S

[33] G. Previati, G. Mastinu, E. Campi, M. Gobbi, L. Uccello, Á. Varela Daniel, A. Albanese, A. Roccasalva, G. Santin, M. Luca, B. Lepri, L. Ferrarotti, N. di Pietro, *Roundabout Traffic: Simulation With Automated Vehicles, AI, 5G, Edge Computing and Human in the Loop*, ASME 2023 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (2023).
https://doi.org/10.1115/DETC2023-116402

[32] A. Alla, H. Oliveira, G. Santin, *HJB-RBF based approach for the control of PDEs*, Journal of Scientific Computing (2023).
https://doi.org/10.1007/s10915-023-02208-3

[31] G. Santin, *Equally spaced points are optimal for Brownian Bridge kernel interpolation*, Applied Mathematics Letters, Vol. 137 (2023).
https://doi.org/10.1016/j.aml.2022.108489

[30] S. Cuomo, W. Erb, G. Santin, *Kernel-Based Models for Influence Maximization on Graphs based on Gaussian Process Variance Minimization*, Journal of Computational and Applied Mathematics, Vol. 423 (2023).
https://doi.org/10.1016/j.cam.2022.114951

[29] T. Wenzel, G. Santin, B. Haasdonk, *Analysis of target data-dependent greedy kernel algorithms: Convergence rates for f-, $f \cdot P$- and f/P-greedy*, Constructive Approximation, Vol. 57 (2023), 45-74.
https://doi.org/10.1007/s00365-022-09592-3

[28] F. Marchetti, G. Santin, *Convergence results in image interpolation with the continuous SSIM*, SIAM Journal on Imaging Sciences, Vol. 15 (2022), 1977-1999.
https://doi.org/10.1137/22M147637X

[27] B. Nobile, G. Santin, B. Lepri, P. Brutti, *Reprogramming FairGANs with Variational Auto-Encoders: A New Transfer Learning Model*, Book of short papers, SIS 2022 - 51st Scientific Meeting of the Italian Statistical Society (2022), 1662-1668.
https://arxiv.org/abs/2203.05811

[26] R. Campagna, S. De Marchi, E. Perracchione, G. Santin, *Greedy algorithms for learning via exponential-polynomial splines*, Advances in Computational Mathematics, Vol. 48 (2022).
https://doi.org/10.1007/s10444-022-09986-8

[25] G. Santin, I. Skarbovsky, F. Fournier, B. Lepri, *A Framework for Verifiable and Auditable Collaborative Anomaly Detection*, IEEE Access (2022).
https://doi.org/10.1109/ACCESS.2022.3196391

[24]   T. Wenzel, M. Kurz, A. Beck, G. Santin, B. Haasdonk, *Structured Deep Kernel Networks for Data-Driven Closure Terms of Turbulent Flows*, Proceedings of the 13th International Conference on "Large Scale Scientific Computations" (2022), 410–418.
https://doi.org/10.1007/978-3-030-97549-4_47

[23]   E. Leoni, G. Cencetti, G. Santin, T. Istomin, D. Molteni, G. P. Picco, E. Farella, B. Lepri, A. M. Murphy, *Measuring close proximity interactions in summer camps during the COVID-19 pandemic*, EPJ Data Science, Vol. 11 (2022), 5.
https://doi.org/10.1140/epjds/s13688-022-00316-y

[22]   B. Haasdonk, B. Hamzi, G. Santin, D. Wittwar, *Kernel methods for center manifold approximation and a data-based version of the Center Manifold Theorem*, Physica D: Nonlinear Phenomena, Vol. 427 (2021), 133007.
https://doi.org/10.1016/j.physd.2021.133007

[21]   G. Santin, B. Haasdonk, *Kernel Methods for Surrogate Modeling*, *Model Order Reduction, Volume 1: System- and Data-Driven Methods and Algorithms*, P. Benner, W. Schilders, S. Grivet-Talocia, A. Quarteroni, G. Rozza, L. M. Silveira Eds. (2021).
https://doi.org/10.1515/9783110498967-009

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https://doi.org/10.1007/978-3-030-55874-1_49

[19]   G. Santin, T. Karvonen, B. Haasdonk, *Sampling based approximation of linear functionals in Reproducing Kernel Hilbert Spaces*, BIT (2021).
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[18]   G. Cencetti, G. Santin, A. Longa, E. Pigani, A. Barrat, C. Cattuto, S. Lehmann, M. Salathé, B. Lepri, *Digital proximity tracing on empirical contact networks for pandemic control*, Nature Commun., Vol. 12 (2021), 1655.
https://doi.org/10.1038/s41467-021-21809-w

[17]   T. Wenzel, G. Santin, B. Haasdonk, *A novel class of stabilized greedy kernel approximation algorithms: Convergence, stability and uniform point distribution*, J. of Approx. Theory, Vol. 262 (2021), 105508.
https://doi.org/10.1016/j.jat.2020.105508

[16]   B. Haasdonk, B. Hamzi, G. Santin, D. Wittwar, *Greedy kernel methods for center manifold approximation*, Spectral and High Order Methods for Partial Differential Equations ICOSAHOM 2018, S. Sherwin, D. Moxey, J. Peiró, P. E. Vincent, and C. Schwab Eds. (2020), 95–106.
https://doi.org/10.1007/978-3-030-39647-3_6

[15]   T. Brünnette, G. Santin, and B. Haasdonk, *Greedy kernel methods for accelerating implicit integrators for parametric ODEs*, Numerical Mathematics and Advanced Applications ENUMATH 2017, F.A. Radu, K. Kumar, I. Berre, J.M. Nordbotten, I.S. Pop, Eds (2019), 889–896.
https://doi.org/10.1007/978-3-319-96415-7_84

[14]   D. Wittwar, G. Santin, B. Haasdonk, *Interpolation with uncoupled separable matrix-valued kernels*, Dolomites Res. Notes Approx., Vol. 11 (2018), 23–29.
http://dx.doi.org/10.14658/pupj-drna-2018-3-4

[13]   M. Köppel, F. Franzelin, I. Kröker, G. Santin, D. Wittwar, S. Oladyshkin, A. Barth, B. Haasdonk, W. Nowak, D. Pflüger, C. Rohde, *Comparison of data-driven uncertainty quantification methods for a carbon dioxide storage benchmark scenario*, Comput. Geosci (2018).
https://doi.org/10.1007/s10596-018-9785-x

[12]   T. Köppl, G. Santin, B. Haasdonk, R. Helmig, *Numerical modelling of a peripheral arterial stenosis using dimensionally reduced models and kernel methods*, Int. J. Numer. Meth. Biomed. Engng., Vol. 34 (2018), e3095.
https://doi.org/10.1002/cnm.3095

[11]   S. De Marchi, A. Iske, G. Santin, *Image reconstruction from scattered Radon data by weighted positive definite kernel functions*, Calcolo, Vol. 55 (2018).
https://doi.org/10.1007/s10092-018-0247-6

[10] G. Santin, B. Haasdonk, *Greedy kernel approximation for sparse surrogate modelling*, Reduced-Order Modeling (ROM) for Simulation and Optimization: Powerful Algorithms as Key Enablers for Scientific Computing, W. Keiper, A. Milde, and S. Volkwein, Eds (2018), 21–45.

https://doi.org/10.1007/978-3-319-75319-5_2

[9] S. De Marchi, A. Idda, G. Santin, *A rescaled method for RBF approximation*, Proceedings of "Approximation Theory 15", San Antonio (Texas), Springer Proceedings on Mathematics and Statistics, Vol. 201 (2017), 39–59.

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[8] G. Santin, B. Haasdonk, *Convergence rate of the data-independent P-greedy algorithm in kernel-based spaces*, Dolomites Res. Notes Approx., Vol. 10 (2017), 68–78.

http://dx.doi.org/10.14658/pupj-drna-2017-Special_Issue-9

[7] R. Cavoretto, S. De Marchi, A. De Rossi, E. Perracchione, G. Santin, *Partition of unity interpolation using stable kernel-based techniques*, Appl. Numer. Math., Vol. 116 (2017), 95–107.

https://doi.org/10.1016/j.apnum.2016.07.005

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[5] G. Santin, R. Schaback, *Approximation of eigenfunctions in kernel-based spaces*, Adv. Comput. Math., Vol. 42 (4) (2016), 973–993.

https://doi.org/10.1007/s10444-015-9449-5

[4] S. De Marchi, G. Santin, *Fast computation of orthonormal basis for RBF spaces through Krylov space methods*, BIT, Vol. 55 (2015), 949–966.

https://doi.org/10.1007/s10543-014-0537-6

[3] R. Cavoretto, S. De Marchi, A. De Rossi, E. Perracchione, G. Santin, *RBF approximation of large datasets by partition of unity and local stabilization*, CMMSE 2015: Proceedings of the 15th International Conference on Mathematical Methods in Science and Engineering (2015), 317 – 326.

https://iris.unito.it/retrieve/handle/2318/1526172/55702/CMMSE_2015.pdf

[2] S. De Marchi, G. Santin, *A new stable basis for radial basis function interpolation*, J. Comput. Appl. Math., Vol. 253 (2013), 1–13.

https://doi.org/10.1016/j.cam.2013.03.048

[1] G. Santin, A. Sommariva, M. Vianello, *An algebraic cubature formula on curvilinear polygons*, Appl. Math. Comput., Vol. 217(24) (2011), 10003–10015.

https://doi.org/10.1016/j.amc.2011.04.071

Theses . . . .

PhD Thesis	*Approximation in kernel-based spaces, optimal subspaces and approximation of eigenfunctions*, paduaresearch.cab.unipd.it/9186/ (2016).
MSc Thesis	*A new stable basis for Radial Basis Function approximation*, (2012). Led to publication [2].
BSc Thesis	*Algebraic cubature on general domains by the software system Chebfun*, (2009). Led to publication [1].

Open source software and datasets

2022	Explaining the Explainers in Graph Neural Networks (Python) https://github.com/AntonioLonga/Explaining-the-Explainers-in-Graph-Neural-Networks
2022	Federated Fraud Detection (Python) https://github.com/GabrieleSantin/federated_fraud_detection
2021	GBFlearn-Python (Python) https://github.com/GabrieleSantin/GBFlearn-Python

2020	Digital Proximity Tracing in the COVID-19 Pandemic on Empirical Contact Networks (Python) https://github.com/DigitalContactTracing/covid_code
2019	VKOGA – Vectorial Kernel Orthogonal Greedy Algorithm (Python) https://github.com/GabrieleSantin/VKOGA
2018	Regularized VKOGA – Vectorial Kernel Orthogonal Greedy Algorithm (MATLAB) https://gitlab.mathematik.uni-stuttgart.de/santinge/VKOGA
2017	Datasets and executables of data-driven uncertainty quantification benchmark in carbon dioxide storage (dataset of publication [15]), zenodo.org/record/933827
2015	EigenApprox (MATLAB) https://github.com/GabrieleSantin/EigenApprox

Scientific presentations

Invited presentations . . . .

09/2025	MUD 2025, Multiresolution Methods for Unstructured Data: Past, Present and Future, Lugano (Switzerland), <u>Talk:</u> *Superconvergence in Kernel Interpolation: A General Framework and Algorithmic Implications*
09/2025	YAMC 2025, Young Applied Mathematicians Conference, Padova (Italy), <u>Talk:</u> *Greedy Kernel Interpolation: Theory and Applications*
02/2025	SA 2025, Software for Approximation, Torino (Italy), <u>Talk:</u> *Greedy interpolation in kernel spaces: Some new results and the VKOGA package*
11/2023	Machine Learning and Dynamical Systems Seminar (online), <u>Talk:</u> *Hands-on Tutorial on Graph Deep Learning: Part I, theory*
03/2023	SIAM CSE 2023, Amsterdam, <u>Talk:</u> *Probabilistic Sampling for High Dimensional Kernel Based Approximation* <u>MS:</u> High-Fidelity and Data-Driven Methods for Multiscale and Multi-Physics Problems
03/2022	SIAM PD 2022 (online), <u>Talk:</u> *Kernel methods for center manifold approximation* <u>MS:</u> Kernel Based Methods for PDEs
02/2022	MIDA seminars, Genova (online), <u>Talk:</u> *Sampling strategies for approximation in kernel spaces*
11/2021	ATMA 2021, Approximation: Theory, Methods, and Applications, <u>Talk:</u> *Kernel methods for center manifold approximation*
09/2021	SIMAI 2020+2021 Parma (Italy), <u>Talk:</u> *Sampling strategies for approximation in kernel spaces* <u>MS:</u> New Trends and Applications in Approximation Theory
06/2021	8th European Congress of Mathematics (online), <u>Talk:</u> *Sampling strategies for approximation in kernel spaces* <u>MS:</u> Approximation Theory and Applications
05/2021	[GL(GL)](TAA), first seminar of the U.M.I. group *Approximation Theory and Applications* (online), <u>Talk:</u> *Kernel-based models for influence maximization on graphs based on Gaussian process variance minimization*
06/2020	Online International Workshop on Radial Basis Functions: Theories, Applications, and Recent Advances (online), <u>Talk:</u> *Greedy methods in kernel based approximation: Interpolation, quadrature and sparsity*
07/2019	ICIAM 2019, Valencia (Spain), <u>Talk:</u> *Sparse surrogates with kernel methods* <u>MS:</u> Manifold Sensing and Sparse Recovery
06/2019	MOR Seminar, Stuttgart (Germany), <u>Talk:</u> *Data-based surrogate models by kernel methods*

05/2019	Safety Simulation Framework for Integral Protection Systems, Stuttgart (Germany), <u>Talk:</u> *Kernel methods for data-based surrogate modeling*
07/2018	ICOSAHOM 2018, London (United Kingdom), <u>Talk:</u> *Kernel-based surrogate models for parametric differential equations* <u>MS:</u> Recent advances in Radial Basis Function methods
06/2018	SIAM Conference on Imaging Science, Bologna (Italy), <u>Talk:</u> *Image reconstruction from scattered data by kernel methods* <u>MS:</u> Interpolation and approximation methods in imaging
05/2018	SPAN, Padova (Italy), <u>Talk:</u> *Regularized kernel greedy algorithms*
09/2017	ENUMATH 2017, Voss (Norway), <u>Talk:</u> *Greedy kernel methods for accelerating implicit integrators for parametric ODEs* <u>MS:</u> Reduced order models for time-dependent problems
09/2016	MAIA 2016, CIRM, Luminy (France), <u>Talk:</u> *Non-symmetric kernel-based greedy approximation*
09/2016	DWCAA 2016, Alba di Canazei (Italy), <u>Talk:</u> *Non-symmetric kernel-based greedy approximation* <u>MS:</u> Meshless methods
07/2016	Stuttgart-Tübingen Seminar, Stuttgart (Germany), <u>Talk:</u> *Approximation in kernel-based spaces: optimal subspaces and greedy algorithms*

Tutorials ....

03/2023	SIAM CSE 2023, Amsterdam, *A Hands-on Introduction to Geometric Deep Learning, with Examples in PyTorch Geometric*, with Antonio Longa (Bruno Kessler Foundation). The tutorial has been accepted after an open call by the conference organizing committee, together with other 5 tutorials. The acceptance included the covering of the conference fee and part of the travel expenses of the two speakers.

Contributed presentations ....

05/2024	NAVE 2024, Numerical Analysis in Veneto, Venice (Italy), <u>Talk:</u> *Kernel methods for surrogate modeling of complex simulations*
09/2022	GIMC SIMAI Young 2022, Pavia (Italy), <u>Talk:</u> *Probabilistic sampling for high dimensional kernel based approximation* <u>MS:</u> Kernel methods for computational sciences and simulation
02/2022	SA 2022, Software for Approximation, Torino (Italy), <u>Talk:</u> *VKOGA: A package for greedy kernel approximation*
09/2019	DRWA 2019, Alba di Canazei (Italy), <u>Talk:</u> *(Slow but) Dimension independent rates for adaptive interpolation and quadrature* <u>MS:</u> Radial Basis Functions and kernel methods
09/2017	ENUMATH 2017, Voss (Norway), <u>Talk:</u> *Greedy methods for kernel-based approximation* <u>MS:</u> Kernel methods for large scale problems
09/2015	DRWA 2015, Alba di Canazei (Italy), <u>Talk:</u> *Approximation of eigenfunctions*
07/2015	CMMSE 2015, Cadiz (Spain), <u>Talk:</u> *RBF approximation of large datasets by partition of unity and local stabilization*
09/2014	SPAN, Padova (Italy), <u>Talk:</u> *Approximation in kernel based spaces*
09/2014	DRWA 2014, Alba di Canazei (Italy), <u>Talk:</u> *Fast computation of orthonormal bases*

06/2014	First Joint International Meeting RSME-SCM-SEMA-SIMAI-UMI, Bilbao (Spain), <u>Talk:</u> *Bases for Radial Basis Function approximation* <u>MS:</u> Special functions, orthogonal polynomials and applications
11/2013	Multivariate Approximation, Verona (Italy), <u>Talk:</u> *A fast algorithm for computing a truncated orthonormal basis for RBF native spaces*
10/2013	International CAE Conference, Pacengo del Garda (Italy), <u>Talk:</u> *Some tools for fast and stable Radial Basis Function approximation with Scilab*
08/2013	9th ISAAC Congress, Krakow (Poland), <u>Talk:</u> *A orthonormal basis for Radial Basis Function approximation* <u>MS:</u> Integral transforms and reproducing kernels
06/2013	Constructive Theory of Functions, Sozopol (Bulgaria), <u>Talk:</u> *A fast algorithm for computing a truncated orthonormal basis for RBF native spaces*

Poster presentations..

01/2023	ATMA 2023, Padova (Italy), <u>Poster:</u> *Interpolation with the polynomial kernels*
03/2016	MORML 2016, Stuttgart (Germany), <u>Poster:</u> *Greedy kernel interpolation surrogate modeling*
10/2013	International CAE Conference, Pacengo del Garda (Italy), <u>Poster:</u> *Kernel methods for Radon transform*
09/2013	DRWA 2013, Alba di Canazei (Italy), <u>Poster:</u> *WSVD basis for RBF and Krylov subspaces*
09/2012	DWCAA 2012, Alba di Canazei (Italy), <u>Poster:</u> *A new stable basis for RBF approximation*

Academic Services

Since 2025	Member of the committee for the wider impact (terza missione), Department of Environmental Sciences, Informatics and Statistics, University of Venice.
Since 2025	Member of the Quality Assurance Group (Gruppo Assicurazione della Qualità), Bsc. in Computer Science, University of Venice
09/2025	Organizer of the mini-symposium *Approximation and Inference with Kernels*, ENUMATH 2025, Heidelberg (Germany), with T. Karvonen and T. Wenzel.
09/2024	Member of the organizing committee of *DWCAA23*, Trento (Italy).
05/2024	Member of the organizing committee of the workshop NAVE - Numerical Analysis in Veneto, Mestre (Italy).
11/2023	Member of the organizing committee of the LOG-Meetup (Learning on Graph Conference), Trento (Italy).
09/2023	Member of the organizing committee of *DRWA23*, Trento (Italy).
03/2023-	Editor of the journal "Dolomites Research Notes on Approximation", Padova University Press.
03/2023	Member of the Program Committee, 9th Annual International Conference on Computational Social Science (IC2S2 2023).
01/2023	Member of the organizing committee of *ATMA2023*, Padova (Italy).
10/2022	Guest editor of the Dolomites Research Notes on Approximation, Vol. 15, Special issue on the 5-th Dolomites Workshop on Constructive Approximation and Applications, with F. Marchetti (Univ. of Padova) and E. Perracchione (Polytechnic Univ. of Torino).
09/2022	Organizer of the mini-symposium *Kernel methods for computational sciences and simulation*, GIMC SIMAI Young 2022, Pavia (Italy), with F. Marchetti (Univ. of Padova).
2021-	Evaluator for the admission to the ELLIS PhD Program, ELLIS - the European Laboratory for Learning and Intelligent Systems.

09/2021	Organizer of the mini-symposium *Meshless methods*, DWCAA21, with E. Perracchione (University of Genova).
09/2021	Member of the organizing committee of the *DWCAA21*, Trento.
06/2021	Member of the program committee of the workshop *Machine Learning and Data Assimilation for Dynamical Systems (MLDADS)* at the International Conference on Computational Science, Krakow.
06/2020	Member of the program committee of the workshop *Machine Learning and Data Assimilation for Dynamical Systems (MLDADS)* at the International Conference on Computational Science, Amsterdam.
09/2019	Member of the organizing committee of the *DRWA19*, Trento.
06/2019	Member of the program committee of the workshop *MLDADS* at the International Conference on Computational Science, Algarve.
09/2018	Organizer of the mini-symposium *Meshless methods and applications*, DRWA 2018, with E. Perracchione (University of Padova).
03/2018	Member of the organizing committee of the *2nd International Conference in Simulation Technology*, Stuttgart.
09/2017	Organizer of the mini-symposium *Kernel methods for large scale problems*, ENUMATH 2017, with E. Larsson (University of Uppsala).
03/2016	Member of the organizing committee of the *MORML 2018* workshop, Stuttgart.
09/2014	Organizer of the seminars *SPAN - Seminari padovani di analisi numerica* at the Department of Mathematics, University of Padova.
Since 2015	Referee activity for the journals *Advances in Computational Mathematics, Applied Mathematics Letters, Applied Mathematics and Computation, BIT-Numerical Mathematics, Bulletin of the Iranian Mathematical Society, Calcolo, Computational and Applied Mathematics, Computer Aided Geometric Design, Computers and Mathematics with Applications, Dolomites Research Notes on Approximation, Engineering Analysis with Boundary Elements, ICLR2025/2026, IEEE Access, IEEE Transactions on Image Processing, IEEE Transactions on Magnetics, Journal of Computational Physics, Journal of Computational and Applied Mathematics, Journal of Mathematical Analysis and Applications, Journal of Machine Learning Research, Mathematical and Computational Applications, Mathematics and Computers in Simulation, Numerical Algorithms,x Results in Mathematics, Scientific Reports, SIAM Journal on Scientific Computing, SN Applied Sciences* .
2013–2015	PhD students' delegate in the council of the Doctoral School in Mathematics and in the council of the Department of Mathematics.
2012–2015	Organizer of the students' seminars of the research group Constructive Approximation and Applications.

Teaching experience

As course instructor . . . .

SS. 2025	*Linear Algebra*, BSc. in Computer Science (6 ECTS), University of Venice. The course covers the basics of linear algebra: complex numbers, vector spaces, linear maps, matrices, diagonalization.).
SS. 2025	*Algebra Lineare*, BSc. in Computer Science (6 ECTS, in Italian), University of Venice. The course covers the basics of linear algebra: complex numbers, vector spaces, linear maps, matrices, diagonalization.).
SS. 2025	*Numerical Algorithms*, BSc. in Computer Science, Bsc. in Environmental Engineering for the Ecological Transition(6 ECTS), University of Venice. The course covers the basics of numerical analysis: floating point system, numerical linear algebra, solution of nonlinear systems, polynomial and spline interpolation, quadrature, solution of ODEs.).
WS. 2023	*Calculus I*, BSc. in Computer Science (6 + 6 ECTS for two cohorts, in Italian), University of Venice. The course covers the first part of the Calculus curriculum (basic topology, limits, derivatives, series, integrals).

WS. 2023	*Mathematics and exercises*, BSc. in Environmental Sciences (6 ECTS, in Italian), University of Venice. The course covers the first part of the Calculus curriculum (basic topology, limits, derivatives, applications).
June 2021	*Introduction to Digital Contact Tracing*, seminars for the BSc. in Health Assistance, University of Bologna (Rimini) - joint lecture with G. Cencetti (FBK). The course gives an introduction to the mathematical principles underlying a digital contact tracing procedure. The main topics are the foundations and principles of the mathematical modeling of the spread of an infectious disease and its containment with an isolation and tracing policy.
WS. 2018−2019	*Introduction to Numerics for PDEs*, MSc. in Mathematics (9 ECTS), University of Stuttgart. The course is dedicated to the study of numerical methods for Partial Differential Equations. The main topics are: Classification of PDEs, Finite Difference method for elliptic problems, Finite Elements method for coercive and inf-sup stable problems, Approximation of parabolic problems, Finite Volumes method for hyperbolic conservation equations. The lecture has been <u>evaluated 1.5/5</u> on average (min: 5, max: 1) by the students attending the lecture.
WS. 2017−2018	*Approximation with Kernel Methods*, MSc. in Mathematics (6 ECTS), University of Stuttgart. The course deals with the theory and implementation of various kernel methods for approximation. The main topics are: Introduction to kernel methods, Connection to the corresponding function spaces and general theory, Approximation of scattered data (Greedy procedures, Regression), Pattern recognition (Classification, Support Vector Machines), Numerical approximation of PDEs by collocation. The lecture has been <u>evaluated 1.5/5</u> on average (min: 5, max: 1) by the students attending the lecture.

As teaching assistant ....

SS. 2018−2019	*Numerische Grundlagen* (Foundations of Numerical Analysis), BSc in Engineering Teaching assistant of Prof. C. Rohde, University of Stuttgart. <u>Main tasks:</u> Preparation of weekly programming exercises through the web-platform ViPLab, including the implementation of the automatic correction code; managing of the Tutors, of the administrative tasks, and of the databases for the ∼ 500 students.
SS. 2017−2018	*Numerische Grundlagen* (Foundations of Numerical Analysis), BSc in Engineering Teaching assistant of Prof. D. Göddeke, University of Stuttgart.
SS. 2016−2017	*Numerische Grundlagen* (Foundations of Numerical Analysis), BSc in Engineering Teaching assistant of Prof. D. Göddeke, University of Stuttgart.
WS. 2016−2017	*Numerische Mathematik I* (Numerical Analysis I), BSc in Mathematics Teaching assistant of Prof. B. Haasdonk, University of Stuttgart. <u>Main tasks:</u> Preparation of weekly exercises, managing of the Tutors, of the administrative tasks, and of the databases for the ∼ 50 students attending the lecture.
SS. 2015−2016	*Numerische Grundlagen* (Foundations of Numerical Analysis), BSc in Engineering Teaching assistant of Prof. B. Haasdonk, University of Stuttgart.
WS. 2015−2016	*Höhere Mathematik I* (Foundations of Analysis and Linear Algebra), BSc in Engineering Teaching assistant of Prof. M. Stroppel, University of Stuttgart. <u>Main tasks:</u> Preparation of weekly exercises and instruction of the ∼ 50 Tutors (the lecture has ∼ 1500 students).
SS. 2014−2015	*Calcolo numerico (Foundations of Numerical Analysis)*, BSc in Engineering Teaching assistant of Prof. S. De Marchi, University of Padova. <u>Main tasks:</u> Support to the ∼ 200 students during the programming laboratories for the solution of programming exercises.
SS. 2013−2014	*Calcolo numerico (Foundations of Numerical Analysis)*, BSc in Engineering Teaching assistant of Prof. L. Bergamaschi, University of Padova
SS. 2012−2013	*Calcolo numerico (Foundations of Numerical Analysis)*, BSc in Engineering Teaching assistant of Prof. L. Bergamaschi, University of Padova

Theses and projects co-supervision

PhD theses

2022–	Martina Rama, PhD in Information Engineering and Computer Science, University of Trento. Co-supervision with B. Lepri.
2022–	Marco Pacini, PhD in Information Engineering and Computer Science, University of Trento. Co-supervision with B. Lepri.
2020–2025	Amna Mohsin, PhD in Mathematics, University of Padova. Co-supervision with M. Putti.
2019–2023	Tizian Wenzel, PhD in Mathematics, University of Stuttgart. Co-supervision with B. Haasdonk.

Research projects

2019–2020	M. F., *Multilayer kernel-based autoencoders*, MSc research project in Simulation Technology, University of Stuttgart.
2018–2019	F. H., *Acceleration of implicit integrators with kernel methods*, MSc research project in Simulation Technology, University of Stuttgart.
2017–2018	M. A., *VKOGA validation and selection by log-marginal likelihood*, BSc research project in Simulation Technology, University of Stuttgart.

MSc theses

2021–2022	B. N., *Reprogramming GANs with fairness constraints*, MSc thesis in Data Science, Fondazione Bruno Kessler and Sapienza University of Roma. Led to publication [31].
2018–2019	T. W., *Weak kernel based greedy algorithms*, MSc thesis in Mathematics, University of Stuttgart. Led to publication [17].
2017–2018	S. M., *Inverse Radon Transformation mit Multiskalen-Kernen* (Inverse Radon transform with multiscale kernels), MSc thesis in Mathematics, University of Stuttgart.
2014–2015	A. I., *A comparison of some RBF interpolation methods*, MSc thesis in Mathematics, University of Padova. Led to publication [9].
2013–2014	S. G., *Kernel-based medical image reconstruction from Radon data*, MSc thesis in Mathematics, University of Padova.

BSc theses

2016–2017	T. B., *Kernel methods for accelerating implicit integrators*, BSc thesis in Simulation Technology, University of Stuttgart. Led to publication [13].
2015–2016	S. M., *Interpolation mit Multiskalen-Kernen* (Interpolation with multiscale kernels), BSc thesis in Mathematics, University of Stuttgart.

Funded research projects and awards

2024-	Participant and coordinator of the local unit for the project "Data-driven discovery and control of multi-scale interacting artificial agent systems" (https://www.di.univr.it/?ent=progetto&id=5971/), Funding scheme: 2022 PRIN-PNRR Progetti di Rilevante Interesse Nazionale of the Italian Minister of University and Research (MUR) funded by the European Union - Next Generation EU.

2023-	Participant and coordinator of the local unit for the project "Perturbation problems and asymptotics for elliptic differential equations: variational and potential theoretic methods" (https://sites.google.com/uniroma1.it/pat/), Funding scheme: 2022 PRIN Progetti di Rilevante Interesse Nazionale of the Italian Minister of University and Research (MUR) funded by the European Union - Next Generation EU.
2022	Participant in the following projects: VERDI - SARS-coV2 variants Evaluation in pRegnancy and paeDIatrics cohorts (https://verdiproject.org/), Funding institution: HORIZON 2020; AI@EDGE - A Secure and Reusable Artificial Intelligence Platform for Edge Computing in Beyond 5G Networks (https://aiatedge.eu/), Funding institution: HORIZON 2020; StealthGoCloud, consulting project; "Metodi di approssimazione data-driven per dati esatti e perturbati", GNCS Project 2022, PI Costanza Conti.
2020	Participant in the following projects: Tech4Safe (https://tech4safe.org/), Funding institution: EIT Digital; INFINITECH - The Flagship Project for Digital Finance in Europe (https://www.infinitech-h2020.eu), Funding institution: HORIZON 2020.
2019	Received funding for a one-year postdoc position within the call "Bando di Concorso a n.4 assegni di collaborazione ad attivitá di ricerca A.A. 2019-2020" by INDAM (declined).
2019	Received funding as PI for a three-year PhD position within the Cluster of Excellence *Data-Integrated Simulation Science* (SimTech).
2018	Participating Scientist in the Cluster of Excellence *Data-Integrated Simulation Science* (SimTech), Funding institution: DFG within the Germany's Excellence Strategy.
2018	Recipient of the *SIAM IS-18 Conference Student/Post-doc Travel Awards* to participate to the SIAM Conference on Imaging Science, Bologna.
2016	Participant in the project *Radial basis functions approximations: stability issues and applications*, PI: S. De Marchi, Funding institution: University of Padova.
2013–2014	Participant in the project *Multivariate approximation with application to image reconstruction*, PI: S. De Marchi, Funding institution: University of Padova.

Affiliations to mathematical groups and professional societies

Since 2025	Member of the Data-Centric Environmental Studies Centre (DESC) and the Research Institute for Complexity, University of Venice.
Since 2020	Member of UMI–Unione Matematica Italiana (member of the groups "Matematica per l'Intelligenza Artificiale ed il Machine Learning" and "Teoria dell'Approssimazione e Applicazioni"), and member of SIAM.
Since 2020	Member of UMI–Unione Matematica Italiana (member of the groups "Matematica per l'Intelligenza Artificiale ed il Machine Learning" and "Teoria dell'Approssimazione e Applicazioni"), and member of SIAM.
Since 2018	Participating Researcher in the Cluster of Excellence *Data-Integrated Simulation Science*.
Since 2017	Associate Researcher in the Cluster of Excellence *Simulation Technology* (SimTech).
2017-2025	Member RITA–Italian research network on approximation.
2017-2023	Member of SIMAI–Societá Italiana di Matematica Applicata e Industriale.
Since 2013	Member of GNCS–INDAM Gruppo Nazionale per il Calcolo Scientifico.

Other skills

Language	Italian: mother tongue, English: fluent, German: intermediate.
Coding	Python, Matlab: advanced knowledge, C, C++: basic knowledge.

Il sottoscritto Gabriele Santin, consapevole che le dichiarazioni false comportano l'applicazione delle sanzioni penali previste ai sensi di legge, dichiara che tutto quanto dichiarato in questo documento corrisponde a verità ai sensi degli articoli 46 e 47 del D.P.R. 445/2000.

Belluno, October 15, 2025