

Martina Iannacito | Curriculum Vitae

Ph.D. in Applied Mathematics and Scientific Computing from the University of Bordeaux

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Research activities

Alma Mater Studiorum - University of Bologna

Italy

Postdoctoral researcher at the Mathematics Department

April 2024 - present

Member of V. Simoncini's research group

Keywords: matrix equation solver, tensor decomposition algorithms, randomization methods

Katholieke Universiteit Leuven

Belgium

Postdoctoral researcher at the Science, Engineering and Technology Faculty

May 2023 - March 2024

Member of L. De Lathauwer's research group

Keywords: blind source separation, algebraic algorithms, canonical polyadic tensor decomposition

Inria Center at the University of Bordeaux

France

Ph.D. student

October 2019 - December 2022

Member of the Concace and HiePACS team

Keywords: inexactness in iterative solvers, low-rank tensor approximations, data analysis

University of Trento

Italy

Master's student

January 2019 - July 2019

Member of the Mathematics Department

Keywords: tensor compression, hyperspectral images, remote sensing, biodiversity estimate

Education

Inria Center at the University of Bordeaux

France

Ph.D. in Applied Mathematics and Scientific Computing

October 2019 - December 2022

Thesis supervised by O. Coulaud and L. Giraud

Defence date December 9, 2022

University of Trento

Italy

Master's Degree in Applied Mathematics for Life and Data Science

December 2017 - July 2019

Thesis supervised by A. Bernardi and D. Rocchini

Defence date July 17, 2019, Summa Cum Laude

University of Parma

Italy

Bachelor's Degree in Mathematics

October 2014 - December 2017

Thesis supervised by A. Bandini

Defence date December 14, 2017, Summa Cum Laude

Scientific High School G. Aselli

Italy

Maturity diploma

September 2009 - July 2014

Defence date July 4, 2014, Summa Cum Laude

Publications

Thesis

- [T2] M. Iannacito. (Dec 2022). “Numerical linear algebra and data analysis in large dimensions using tensor format”. PhD thesis. Inria Center at the University of Bordeaux, France. URL: theses.fr/s349733
- [T1] M. Iannacito. (Jul 2019). “HOSVD for multispectral images. A numerical approach to the plant biodiversity estimate.” Master’s thesis. University of Trento, Italy. URL: webapps.unitn.it/Biblioteca/it/Web/RichiestaConsultazioneTesi/365719

International journals

*Authors alphabetically ordered

- [J8*] Coulaud, O., L. Giraud, M. Iannacito, and M. Issa (2026). “Solving eigenvalue problems in high dimensions using contour integration and Tensor Train format”. In: *SIAM Journal on Scientific Computing*. In press. URL: inria.hal.science/hal-05017425v2.
- [J7*] Coulaud, O., L. Giraud, and M. Iannacito (2025). “On some orthogonalization schemes in Tensor Train format”. In: *BIT Numerical Mathematics* 65.4, p. 45. DOI: 10.1007/s10543-025-01086-5.
- [J6] Palitta, D., M. Iannacito, and V. Simoncini (2025). “A Subspace–Conjugate Gradient Method for Linear Matrix Equations”. In: *SIAM Journal on Matrix Analysis and Applications* 46.4, pp. 2197–2225. DOI: 10.1137/25M1723402.
- [J5*] Coulaud, O., L. Giraud, and M. Iannacito (Jan. 2025). “A note on TT-GMRES for the solution of parametric linear systems”. In: *Electronic Transactions on Numerical Analysis* 62, pp. 163–187. DOI: 10.1553/etna_vol62s163.
- [J4*] Bernardi, A., M. Iannacito, and D. Rocchini (Dec. 2021). “High order singular value decomposition for plant diversity estimation”. In: *Bollettino dell’Unione Matematica Italiana* 14.4, pp. 557–591. DOI: 10.1007/s40574-021-00300-w.
- [J3] Thouverai, E., M. Marcantonio, G. Bacaro, D. Da Re, M. Iannacito, E. Marchetto, C. Ricotta, C. Tattoni, S. Vicario, and D. Rocchini (Apr. 2021). “Measuring diversity from space: a global view of the free and open source rasterdiv R package under a coding perspective”. In: *Community Ecology* 22.1, pp. 1–11. DOI: 10.1007/s42974-021-00042-x.
- [J2] Rocchini, D., E. Thouverai, M. Marcantonio, M. Iannacito, D. Da Re, M. Torresani, G. Bacaro, M. Bazzichetto, A. Bernardi, G. M. Foody, R. Furrer, D. Kleijn, S. Larsen, J. Lenoir, M. Malavasi, E. Marchetto, F. Messori, A. Monkeywordhi, V. Moudrý, B. Naimi, C. Ricotta, M. Rossini, F. Santi, M. J. Santos, M. E. Schaepman, F. D. Schneider, L. Schuh, S. Silvestri, P. Šímová, A. K. Skidmore, C. Tattoni, E. Tordoni, S. Vicario, P. Zannini, and M. Wegmann (Feb. 2021). “rasterdiv—An Information Theory tailored R package for measuring ecosystem heterogeneity from space: To the origin and back”. In: *Methods in Ecology and Evolution* 12.6, pp. 1093–1102. DOI: 10.1111/2041-210X.13583.
- [J1] Rocchini, D., M. Marcantonio, D. Da Re, G. Bacaro, E. Feoli, G. M. Foody, R. Furrer, R. J. Harrigan, D. Kleijn, M. Iannacito, J. Lenoir, M. Lin, M. Malavasi, E. Marchetto, R. S.

Meyer, V. Moudry, F. D. Schneider, P. Šímová, A. H. Thornhill, E. Thouverai, S. Vicario, R. K. Wayne, and C. Ricotta (Mar. 2021). “From zero to infinity: Minimum to maximum diversity of the planet by spatio-parametric Rao’s quadratic entropy”. In: *Global Ecology and Biogeography* 30.5, pp. 1153–1162. DOI: 10.1111/geb.13270.

Preprints

*Authors alphabetically ordered

[RR2*] Agullo, E., O. Coulaud, L. Giraud, M. Iannacito, G. Marait, and N. Schenkels (Sep. 2022). *The backward stable variants of GMRES in variable accuracy*. Tech. rep. RR-9483. Inria, p. 1-77. URL: <https://hal.science/hal-03776837>.

[RR1*] Coulaud, O., A. Franc, and M. Iannacito (Nov. 2021). *Extension of Correspondence Analysis to multiway data-sets through High Order SVD: a geometric framework*. Tech rep. RR-9429. Inria Bordeaux - Sud-Ouest; Inrae, p. 24. URL: <https://hal.science/hal-03418404>.

Conferences and workshop talks

[S9] Iannacito, M., D. Palitta, and V. Simoncini (Jan. 2026). “A Subspace–Conjugate Gradient method for linear matrix equations”. In: *11th Workshop on Matrix Equations and Tensor Techniques*. Org. by P. Benner, H. Faßbender, L. Grasedyck, D. Kressner, B. Meini, V. Simoncini, L. De Lathauwer. Leuven, Belgium.

[S9] Iannacito, M., D. Palitta, and S. Portaro (Oct. 2025). “A practical, fully parallel implementation of the (H-)Tucker decomposition via randomization”. In: *Workshop on Approximate Computing in Numerical Linear Algebra*. Org. by A. Buttari, F. Jézéquel, and T. Mary. Paris, France.

[S8] Iannacito, M., D. Palitta, and V. Simoncini (Sep. 2025). “A Subspace–Conjugate Gradient method for linear matrix equations”. In: *Low-rank Structures and Numerical Methods in Matrix and Tensor Computations*. Org. by M. Benzi, B. Meini, V. Simoncini, F. Durastante, C. Pagliantini, and D. Palitta. Cortona, Italy.

[S7] Iannacito, M., O. Coulaud, and L. Giraud (May 2024). “Orthogonalization schemes in tensor train format”. In: *Approximate Computing Techniques for Orthogonalization Processes*. Org. by B. Vieuillé and O. Balabanov. Paris, France: SIAM Conference on Applied Linear Algebra.

[S6] Iannacito, M., L. De Lathauwer, and I. Domanov (Sep. 2023). “An algebraic algorithm for blind source separation and tensor decomposition”. In: *Matrix Equations and Tensor Techniques X*. Org. by P. Benner, H. Faßbender, L. Grasedyck, D. Kressner, B. Meini, and V. Simoncini. Aachen, Germany.

[S5] Iannacito, M., L. De Lathauwer, and I. Domanov (Aug. 2023). “An algebraic algorithm for blind source separation and tensor decomposition”. In: *New Directions in Applied Linear Algebra*. Org. by J. Cockayne, J. Pearson, J. Pestana, D. Silvester, and V. Simoncini. Banff, Canada: Banff International Research Station.

[S4] Iannacito, M., O. Coulaud, and L. Giraud (Jul. 2023). “On Some Orthogonalization Schemes in Tensor Train Format”. In: *Geometry in Optimization and Numerical (Multi)Linear*

Algebra. Org. by U. Konstantin and Y. Qi. Eindhoven / Hybrid, Netherlands: SIAM Conference on Applied Algebraic Geometry.

- [S3] Iannacito, M., O. Coulaud, and L. Giraud (Jun. 2023). “Orthogonalization schemes in Tensor Train format”. In: *Approximate computing in numerical linear algebra*. Org. by N. Higham, X. Liu, and B. Vieuublé. University of Strathclyde Glasgow. Glasgow, United Kingdom: 29th Biennial Conference on Numerical Analysis.
- [S2] Iannacito, M., O. Coulaud, and A. Franc (Sep. 2022). “Extension of Correspondence Analysis to multiway data-sets through HOSVD: a geometric framework”. In: *Tensor Decompositions for Data Science*. Org. by R. Minster and N. Vannieuwenhoven. San Diego / Hybrid, United States: SIAM Conference on Mathematics of Data Science.
- [S1] Iannacito, M., E. Agullo, O. Coulaud, L. Giraud, G. Marait, and N. Schenkels (Sep. 2022). “GMRES in variable accuracy: a case study in low rank tensor linear systems”. In: *GAMM - Workshop on Applied and Numerical Linear Algebra 2022*. Org. by E. Carson, I. Hnětynková, S. Pozza, P. Tichý, and M. Tůma. Prague, Czech Republic.

Seminars

- [S9] Iannacito, M., D. Palitta, and V. Simoncini (Jan. 2026). “A Subspace–Conjugate Gradient Method for Linear Matrix Equations”. In: Multilinear Models for Control and Diagnosis of Energy Systems team. Hamburg, Germany: HAW Hamburg.
- [S8] Iannacito, M. (Dec. 2024). “Tensor Train: description and applications”. In: Course of Matrix and Tensor methods for Data Science. Bologna, Italy: Department of Mathematics, Alma Mater Studiorum - University of Bologna.
- [S7] Iannacito, M. (Apr. 2024). “Potential and applications of tensor-based algorithms”. In: Scube. Bologna, Italy: Department of Mathematics, Alma Mater Studiorum - University of Bologna.
- [S6] Iannacito, M. (Dec. 2023). “Tensor-based algorithms: applications and challenges”. In: Algorithmes Parallèles et Optimisation team. Toulouse, France: ENSEEIHT.
- [S5] Iannacito, M. (Nov. 2023). “Introduzione ai tensori: dalle applicazioni alle sfide contemporanee”. In: Pisan Young Seminars in Applied and NUMerical Mathematics. Pisa, Italy: Department of Mathematics, University of Pisa.
- [S4] Iannacito, M. (Nov. 2023). “Discovering tensors: their challenges and applications”. In: TensorDay 2023. Trento, Italy: Department of Mathematics, University of Trento.
- [S3] Iannacito, M., L. De Lathauwer, and I. Domanov (Oct. 2023). “From blind source separation to tensor decomposition: an algebraic algorithm”. In: NUMA seminars. Leuven, Belgium: Department of Computer science, KU Leuven.
- [S2] Iannacito, M., O. Coulaud, and L. Giraud (Feb. 2022). “Solving linear systems in high dimension with TT-GMRES”. In: Working group on tensors. Bordeaux, France: Inria Center at the University of Bordeaux.

- [S1] Iannacito, M., O. Coulaud, and A. Franc (May 2020). “Malabar dataset: data analysis in tensor format”. In: Working group on tensors. Bordeaux, France: Inria center at the University of Bordeaux.

Teaching activities

Alma Mater Studiorum - University of Bologna

Adjunct lecturer, 5 hours

Master's Degree in Mathematics

Matrix and Tensor Techniques for Data Science

Italy

November 2025

Alma Mater Studiorum - University of Bologna

Adjunct lecturer, 15 hours

Bachelor's Degree in Mathematics

Computational Mathematics: Matrix methods for Data Science

Italy

February 2025 - May 2025

Alma Mater Studiorum - University of Bologna

Tutor, 20 hours

Bachelor's Degree in Architecture

Principles of Mathematics II

Italy

December 2025 - June 2025

KU Leuven - Bruges

Adjunct lecturer, 6 hours

Master's Degree of AI in Business and Industry

Applied AI: Academic Perspectives, AI & Tensors

Belgium

January 2024 - March 2024

ENSEIRB-MatMeca

Adjunct lecturer, 47 hours

Engineering Degree in Computer Science

Numerical Algorithms

France

March 2021 - May 2022

University of Trento

Tutor, 50 hours

Master's Degree in Data Science

Statistical Learning: Statistical Models

Italy

January 2019 - June 2019

Related activities

Una Europa Virtual Exchanges for Sustainability Erasmus+

Moderator

University of Bologna

October 2025 - December 2025

Final Education Project

External jury member

ENSEIRB Bordeaux

September 2022

Master's students supervision

Kobe Sauwens

Master's Degree in Mathematical Engineering

Thesis supervised by L. De Lathauwer and V. Rijmen

“Exploration of Polyadic Tensor Decomposition as a tool for public key cryptography”

KU Leuven

September 2023 - March 2024

Andreas Devogel

Master's Degree in Mathematical Engineering

KU Leuven

September 2023 - March 2024

Thesis supervised by L. De Lathauwer
"Algebraic algorithms for tensor-based signal separation "

Bachelor students supervision

Margherita Todesco
Bachelor's Degree in Mathematics
Thesis supervised by V. Simoncini
"HOSVD: analysis and implementation"

University of Bologna
December 2024 - July 2025

Internship students supervision

Léo Bertheas
Electrical and Electronics Engineering Degree
2nd year stage supervised by O. Coulaud, L. Giraud, and J. R. Poirier
"Solving the heat equation in Tensor Train format"

ENSEEIH Toulouse
June 2021 - August 2021

Research visiting

Invited postdoctoral visiting
Department of Biomedical Engineering, HAW Hamburg
Invited by G. Lichtenberg

Hamburg
January 2026

Scholarships, awards and qualifications

Invited speaker at 2-days workshop
Sandpit Workshop "Tensor Decompositions 2.0"
Organized by K. Batselier and G. Lichtenberg
Sponsored by Klaus-Tschira Stiftung

Heidelberg
2025

Invited speaker at 5-days workshop
BIRS workshop "New Directions in Applied Linear Algebra"
Organized by J. Cockayne, J. Pearson, J. Pestana, D. Silvester, and V. Simoncini
Hosted by Banff International Research Station

Banff
2023

Early Career Travel Award
Society of Industrial and Applied Mathematics

Eindhoven
2023

Qualification for Associate Professor positions
Centre National des Universités
Section 26, Applied Mathematics

France
2023

Best Master's thesis of the Mathematics Department
Mathematics Department at the University of Trento

Trento
2019

Training activities

Integration of artificial intelligence tools into teaching
Plenary courses
EDVANCE: Digital Education Hub Higher Education

Bologna
2025

3rd CINI HPC Summer school
Plenary courses and hands-on sessions

Naples
2025

International Summer School on High-Performance Computing
for Science, Industry, and Society

Machine learning in Python with scikit-learn

Practical aspects and regular exercises with Jupyter notebooks

MOOC, Inria Learning Lab, scikit-learn @ La Fondation Inria, Inria Academy, probabl

Online

2021

High Performance Numerical Simulation

Plenary courses and hands-on sessions

Simulation of a harmonic wave propagation,
from modelling to implementation in an HPC framework

Inria Bordeaux

2019

Software contributions

pyTensorlab

Python package for tensor computations

2025

ssc

Subspace-conjugate gradient method for linear matrix equations

2025

Rasterdiv

Methods to calculate indices of diversity on numerical matrices based on information theory

2020

IT skills

Coding languages Python, MATLAB, R, C++

OS Linux, Windows

Collaborative tools GitHub, GitLab

Languages

English Read, written, spoken *Cambridge ESOL FCE (B2) in 2013*

French Read, written, spoken *Diplôme d'études en langue française (B1) in 2012*

Italian Read, written, spoken *Native*