

Arianna Travaglini

Curriculum Vitae

Education and Training

- 2011 – 2016 Scientific High School Diploma, Istituto Omnicomprensivo “Ciampoli – Spaventa”, Atessa (CH). Grade: 100/100 *cum laude*.
- 2016 – 2019 Bachelor’s Degree in Mathematics (L-35), University of Perugia. Supervisor: Prof. Patrizia Pucci. Final grade: 105/110. Graduation date: 18/07/2019.
- 2019 – 2021 Master’s Degree in Mathematics (LM-40), curriculum “Matematica per le Applicazioni Industriali e Biomediche”, University of Perugia. Supervisor: Prof. Gianluca Vinti. Final grade: 110/110 *cum laude*. Graduation date: 29/10/2021.
- Nov. 2021 – Oct. 2024 PhD in Mathematics, Computer Science, and Statistics (curriculum: Mathematics), University of Florence – University of Perugia – INdAM. Awarded with a full grant. Supervisor: Prof. Gianluca Vinti.
- July – Aug. 2022 Summer School of Mathematics – Scuola Matematica Interuniversitaria (SMI). Courses attended: (1) Functional Analysis (Prof. Nicola Arcozzi); (2) Numerical Analysis (Prof. Carla Manni).
- Feb. 28, 2025 PhD degree awarded **with praise**. Final defense of the PhD program in Mathematics, Computer Science, and Statistics – curriculum “Mathematics”, held at the Department of Mathematics and Computer Science “U. Dini” of the University of Florence.
- July 2025 CIME School “Modern Perspectives in Approximation Theory: Graphs, Networks, quasi-interpolation and Sampling Theory”, Cetraro, Italy, July 21–25, 2025. Awarded a full grant to attend.

Work Experience

- Since 01/07/2026 Research Fellowship, Department of Physics and Geology, University of Perugia. Awardee of a Research Fellowship for collaboration on the project “Mathematical Methods and Models for Thermal Investigations on Nanofluids (M.I.T.N.)”.
- 01/03/2024–28/02/2026 Research Fellowship, University of Basilicata. Recipient of a research grant within the framework of the Tech4You project to carry out research activities at the Department of Engineering, University of Basilicata.
- 2023, 2024, 2025 Organization of the Mathematical Games Championships. Assignment to organize the semifinal of the International Mathematical Games Championships in the years 2023, 2024, and 2025, hosted in Perugia. (Bocconi University.)
- 2022 Teaching assignment within the project “Educational Paths for Enhancing Employment – Skills Intervention 2” – Consorzio Futuro (Ecipa Umbria). Teaching of the intervention “Biomedical Image Analyst (Image Processing Expert)” in the training year “Healthy Umbria”.
- 2021/2022 & 2025/2026 Tutor of the “I Lincei per la Scuola” Foundation – Perugia Pole. Participation, as a tutor, in the activities of the project “I Lincei per la Scuola” of the Accademia Nazionale dei Lincei, Perugia pole.

a.y. University Tutor, University of Perugia. Tutorial activity for the course “Mathematical Analysis I” for the Bachelor’s Degree in Civil and Environmental Engineering (Department of Civil and Environmental Engineering) and for the Bachelor’s Degree in Computer and Electronic Engineering (Department of Engineering) – for a total of 100 hours per year.

Teaching Activities

Since 2022, subject expert for the following courses at the University of Perugia:

- Analisi Matematica I, Bachelor’s Degree in Civil and Environmental Engineering;
- Analisi Matematica I, Bachelor’s Degree in Computer and Electronic Engineering;
- Teoria dell’Approssimazione, Master’s Degree in Mathematics;
- Applied Image and Signal Processing, Master’s Degree in Mathematics.

Awards and Prizes

- 2025 UMI-TAA Award: winner of the UMI-TAA award, which consists of grants awarded to young mathematicians who have made significant contributions to the field of Approximation Theory and Applications. <https://umi-taa.sites.dmi.unipg.it/premi.html>
- 2025 Workshop Chair Certificate of Appreciation, The International Conference on Computational Science and Its Applications (ICCSA 2025), Istanbul, Turkey.
- 2023 Workshop Chair Certificate of Appreciation, The International Conference on Computational Science and Its Applications (ICCSA 2023), Athens, Greece.
- 2018 Study Award: “Study award in favor of the children of BCC bank shareholders, who are distinguished for results in state high schools”. Date: 06/05/2018.
- 2016 Enhancement of Excellence: Cash prize from the Istituto Nazionale di Documentazione, Innovazione e Ricerca Educativa (INDIRE) for having obtained a score of 100 with honors in the state exam (year 2016). Available in the national register of excellence: <https://www.indire.it/eccellenze/>

Organization of Conferences and Workshops

- 2026 Member of the **Local Organizing Committee** of the conference “17th International Conference on Integral Methods in Science and Engineering”, July 20–24, 2026, University of Basilicata, Matera, Italy.
- 2026 Member of the **Program Committee** of the conference “The 26th International Conference on Computational Science and Its Applications (ICCSA 2026)”, June 30 – July 3, 2026, Braga, Portugal.
- 2026 Member of the **Organizing Committee** of the workshop “Mathematical Methods for Image Processing and Understanding 2026” within the ICCSA 2026 Conference, June 30 – July 3, 2026, Braga, Portugal.
- 2025 Member of the **Organizing Committee** of the workshop “Mathematical Methods for Image Processing and Understanding 2025” within the ICCSA 2025 Conference, June 30 – July 3, 2025, Istanbul, Turkey.
- 2023 Member of the **Organizing Committee** of the workshop “Mathematical Methods for Image Processing and Understanding (MMIPU)” within the ICCSA 2023 Conference, July 3–6, 2023, Athens, Greece.

Editorial Activities

Since 2026 Member of the Editorial Board of the international scientific journal *Mathematics*.

- 2024 – 2025 **Guest Editor** for the special issue “Mathematical Methods for Image Processing and Understanding” of the international scientific journal *Mathematics*.
- 2025 Referee for the journals *Dolomites Research Notes on Approximation* and *Biomedical Signal Processing and Control*.
- 2023 Referee for the journals *Mathematical Foundations of Computing* and *Mathematics*.

Research groups and funding sources affiliated with

- 2026 - Member of the Research Center in Mathematics and Applications, Lucian Blaga University of Sibiu, Sibiu, Romania.
- 2021- INDAM GNAMPA Group (Gruppo Nazionale per l'Analisi Matematica, la Probabilità e le loro Applicazioni).
- 2021- RITA Member (Research ITalian network on Approximation).
- 2021- UMI Approximation Theory and Applications (TAA) Group.

Participation in Research Projects

- Since 2026 – Fondazione Cassa di Risparmio di Perugia, Research Call 2025 - Innovative Research Projects: "A.I.T.T.N. - Innovative Digital Imaging Algorithms and Thermographic Techniques for Cooling Electronic Systems Using Nanofluids.
- Since 2025 – GNAMPA Project 2026: “VEL.SAT. – VELOCità di convergenza e SATurazione per operatori generati da distribuzioni” – Coordinator: Prof. Mirella Cappelletti Montano.
- Since 2025 – Project Ma.Me.Mo.Bi.A.: “Mathematical Methods and Models for Biomedical Applications” – financed by the National Recovery and Resilience Plan PNRR-III-C9-2022-I8.
- 2024 – 2026 – Project Tech4You: “Metodi di approssimazione per la misura della qualità del software” – Scientific coordinator: Prof. Vita Leonessa, within the Research and Innovation Program “Tech4You – Technologies for climate change adaptation and quality of life improvement”.
- 2023 – 2024 – GNAMPA Project 2024: “Ricostruzione di segnali, tramite operatori e frame, in presenza di rumore” – Coordinator: Dr. Rosario Corso.
- Since 2023 – Fondazione Cassa di Risparmio di Perugia Project 2023: “La farmacia dei servizi: strumento di valorizzazione dei bisogni socio-assistenziali e diagnostici a livello territoriale in partnership con il Servizio Sanitario Nazionale (con particolare riferimento a quello della Usl Umbria 1)”.
- Since 2023 – Project “MiRA: Mixed Reality and AI Methodologies for Immersive Robotics”, University of Perugia, University Research Fund 2022.
- 2022 – 2023 – GNAMPA Project 2022: “Enhancement e segmentazione di immagini mediante operatori di tipo campionamento e metodi variazionali” – Coordinator: Prof. Gianluca Vinti.
- Since 2022 – Project Me.T.A.B.I.: “Metodi di Teoria dell'Approssimazione e loro applicazioni in ambito Biomedico e Industriale” – Coordinator: Prof. Gianluca Vinti.
- 2022 – 2023 – Fondazione Cassa di Risparmio di Perugia Project M.I.R.A. (2019): “Metodiche di Imaging non invasivo mediante angiografia OCT sequenziale per lo studio delle Retinopatie degenerative dell'Anziano” – Scientific Coordinator: Prof. Gianluca Vinti.

Conferences and Seminars as Invited Speaker

- 04/2026 Dati, Modelli e Clinica: l'Intelligenza Artificiale per la prevenzione della lombalgia, Taormina, Italy, April 17-18, 2026. Participation as **invited speaker**.
- 03/2026 ICATA 2026 – International Conference on Approximation Theory and its Applications, Sibiu, Romania, March 18–20, 2026. Participation as **invited speaker**.
- 07/2025 ICCSA 2025 – The International Conference on Computational Science and Its Applications, Istanbul, Turkey, June 30 – July 3, 2025. Participation as **invited speaker** in the workshop “Mathematical Methods for Image Processing and Understanding 2025”.

- 12/2024 14th AIMS Conference – On Dynamical Systems, Differential Equations and Applications, Abu Dhabi, Arab Emirates, December 16–20, 2024. Participation as **invited speaker** in the special session SS5: Nonlinear Differential Problems on Flat and Curved Structures: Variational and Topological Methods.
- 09/2024 Seminar titled “Approximation by means of nonlinear sampling Durrmeyer operators and biomedical applications”, University of Palermo, Italy, September 18, 2024. Participation as **invited speaker**.
- 06/2024 Seminar titled “Nonlinear sampling Durrmeyer operator and applications”, University of Basilicata, Potenza, Italy, June 5, 2024. Participation as **invited speaker**.
- 12/2023 Final Workshop on the Project Fondazione Perugia M.I.R.A. “Metodiche di Imaging non invasivo mediante angiografia OCT sequenziale per lo studio delle Retinopatie degenerative dell’Anziano”, December 6, 2023. Participation as **invited speaker**.
- 07/2023 17th International Conference on Applied Mathematics and Computer Science, Cluj-Napoca, Romania, July 11–13, 2023. Participation as **invited speaker**.

Conferences and Seminars as Speaker

- 01/2026 ATMA2026 – Approximation: Theory, Methods and Applications, Rende, Italy, January 27–30, 2026. Participation as **speaker**.
- 07/2025 3rd International Conference: Constructive Mathematical Analysis, Konya, Turkey, July 2–5, 2025. Participation as **speaker**.
- 07/2024 ICATA 2024 – International Conference on Approximation Theory and its Applications, Sibiu, Romania, July 17–21, 2024. Participation as **speaker**.
- 06/2024 II Meeting UMI for Doctoral Students, Napoli, Italy, June 13–14, 2024. Participation as **speaker**.
- 09/2023 XXII Congresso dell’Unione Matematica Italiana, Pisa, Italy, September 4–9, 2023. Participation as **speaker**.
- 07/2023 ICCSA 2023 – The International Conference on Computational Science and Its Applications, Athens, Greece, July 3–6, 2023. Participation as **speaker**.
- 06/2023 International Conference on Approximation Theory and Applications, Cetraro, Italy, June 18–22, 2023. Participation as **speaker**.
- 06/2023 FA&QP 2023 – International Workshop on Functional Analysis and Quantum Physics: interplay, challenges and perspectives, Palermo, Italy, June 5–9, 2023. Participation as **speaker**.
- 01/2023 ATMA2023 – Approximation: Theory, Methods and Applications, Padova, Italy, January 18–20, 2023. Participation as **speaker**.
- 11/2022 RITA PhD Days – Seminar sessions dedicated to PhD students of the RITA research group (Research Italian network on Approximation), November 15–16, 2022. Participation as **speaker**.
- 10/2022 ICOMSS’2022 – International E-Conference on Mathematical and Statistical Science: A Selcuk Meeting, Turkey, October 20–22, 2022. Participation as **speaker**.
- 07/2022 FAATNA2022 – Functional Analysis, Approximation Theory and Numerical Analysis, Matera, Italy, July 5–8, 2022. Participation as **speaker**.
- 11/2021 ATMA2021 – Approximation: Theory, Methods and Applications, Reggio Calabria, Italy, November 10–12, 2021. Participation as **speaker**.

Participation in Conferences and Seminars

- 12/2024 WAMA2024 – Workshop on Approximation Methods and Applications, on the occasion of Michele Campiti's 65th birthday, Department of Mathematics, Università degli Studi di Bari Aldo Moro, Bari, Italy, December 5–6, 2024.
- 11/2024 Seminars of Cesari Center: “La matematica del futuro: non solo AI ma tanto altro | Rischi e prospettive”, held by Prof. Vincenzo Vespri, Department of Mathematics and Computer Science, Università degli Studi di Perugia, November 27, 2024.
- 10/2024 Seminars of Cesari Center: “Reti sociali e mobilità umana: dalle interazioni faccia-a-faccia alla scala urbana”, held by Prof. Ciro Cattuto, Department of Physics and Geology, Università degli Studi di Perugia, October 16, 2024.
- 07/2024 2nd AMS-UMI International Joint Meeting, Palermo, Italy, July 23–26, 2024.
- 07/2024 Seminars of Cesari Center: “Modelling hillslope and overland flow interactions under rain”, held by Prof. Dino Torri, Department of Agricultural, Food and Environmental Sciences, Università degli Studi di Perugia, July 3, 2024.
- 06/2024 ATMA2024 – Approximation: Theory, Methods and Applications, Lecce, Italy, June 11–14, 2024.
- 05/2024 Seminars of Cesari Center: “La torsione finita di cilindri iperelastici”, held by Prof. Angelo Marcello Tarantino, Department of Civil and Environmental Engineering, Università degli Studi di Perugia, May 15, 2024.
- 03/2024 Seminars of Cesari Center: “Meccanismi di scelte sociali”, held by Prof. Achille Basile, Department of Economics, Università degli Studi di Perugia, March 31, 2024.
- 01/2024 Seminars of Cesari Center: “La modellazione matematica nella rappresentazione del corpo umano e nella medicina di precisione: esempi di analisi biomeccanica in ambito ortopedico, respiratorio e cardiovascolare”, held by Prof. Alberto Audenino, Department of Engineering, Università degli Studi di Perugia, January 31, 2024.
- 11/2023 Seminars of Cesari Center: “Models and Algorithms for the Computational Medicine of the Heart”, held by Prof. Luca Dedè, Department of Mathematics and Computer Science, Università degli Studi di Perugia, November 29, 2023.
- 07/2023 UMI Centenary Seminars (2022–2024) – Scientific Meeting in Messina, University of Messina, Italy, July 6, 2023 (online).
- 06/2023 Seminar: “Modular approximation in convergence spaces”, held by Prof. Walter Kozłowski (University of New South Wales, Australia), Department of Mathematics and Computer Science, Università degli Studi di Perugia, June 15, 2023.
- 05/2023 UMI Centenary Seminars (2022–2024) – Scientific Meeting in Bologna, University of Bologna, May 27, 2023 (online).
- 03/2023 UMI Centenary Seminars (2022–2024) – Scientific Meeting in Pescara, “G. D'Annunzio” University of Chieti-Pescara, March 30, 2023.
- 01/2023 UMI Centenary Seminars (2022–2024) – Scientific Meeting in Milan, University of Milano-Bicocca, January 26, 2023 (online).
- 12/2022 Seminar: “Around linear positive operators”, held by Prof. Gumrah Uysal (University of Karabuk, Turkey), Department of Mathematics and Computer Science, Università degli Studi di Perugia, December 13–15, 2022.
- 11/2022 UMI Centenary Seminars (2022–2024) – Scientific Meeting in L'Aquila, University of L'Aquila, November 24, 2022 (online).
- 09/2022 UMI Centenary Seminars (2022–2024) – Scientific Meeting in Turin, Oratorio San Filippo Neri, September 29, 2022 (online).

- 09/2022 SMART2022 – Third International Conference on Subdivision, Geometric and Algebraic Methods, Isogeometric Analysis and Refinability in ITaly, Rimini, Italy, September 20–24, 2022.
- 06/2022 UMI Centenary Seminars (2022–2024) – Scientific Meeting in Naples, University of Naples Federico II, June 23, 2022 (online).
- 05/2022 Conference celebrating 100 years of UMI and 800 years of the University of Padua, Padua, Italy, May 23–27, 2022.
- 05/2022 Seminar: “Un modello matematico per la ricostruzione e l’enhancement di immagini digitali e sue applicazioni in ambito medico”, held by Prof. Gianluca Vinti, Università della Campania “Luigi Vanvitelli”, May 16, 2022 (online).
- 05/2022 Seminar: “Uno sguardo dentro le immagini: il ruolo dei modelli e degli algoritmi matematici”, held by Prof. Gianluca Vinti, Department of Mathematics and Computer Science, Università degli Studi di Perugia, May 6, 2022.
- 04/2022 Seminar: “M.C. Escher e l’arte di catturare l’infinito”, held by Prof. Francesco Fumagalli, Department of Mathematics and Computer Science, Università degli Studi di Perugia, April 22, 2022.
- 03/2022 100 Years of UMI in Bologna – a working day dedicated to mathematics and the relationship between the Italian Mathematical Union and the University of Bologna, March 31, 2022 (online).
- 03/2022 Seminar: “Dinamiche collettive e formazione di pattern in sistemi di reazione-diffusione su reti complesse”, held by Dr. Francesca Di Patti, Department of Mathematics and Computer Science, Università degli Studi di Perugia, March 25, 2022.
- 03/2022 Seminar: “La mappa di Eschaton”, held by Prof. Nicola Ciccoli and Marinella Manicardi, Department of Mathematics and Computer Science, Università degli Studi di Perugia, March 14, 2022.
- 02/2022 Seminar: “Information potential for some probability distributions”, held by Prof. Ana Maria Acu, Lucian Blaga University of Sibiu (Romania), Department of Mathematics and Computer Science, Università degli Studi di Perugia, February 28, 2022.
- 06/2021 8th European Congress of Mathematics (8ECM), Portoroz, Slovenia, June 20, 2021.
- 06/2021 Workshop on PDEs and Applications, June 18, 2021 (online).
- 05/2021 Workshop on Analysis and Applications, May 29, 2021 (online).
- 05/2021 Scientific Talks of the Italian Mathematical Union, May 28, 2021 (online).
- 05/2021 First working day of the UMI group “Approximation Theory and Applications”, May 14, 2021 (online).
- 04/2021 Dante e le Discipline del Quadrivio, April 14, 2021 (online).
- 03/2021 Eredità di Lamberto Cesari nella costruzione di nuove sinergie scientifiche, March 26, 2021 (online).
- 03/2021 IOWAT 2021 – International Online Workshop on Approximation Theory, March 19, 2021 (online).
- 11/2020 Colloquium INdAM 2020, November 27, 2020 (online).

Scientific Publications

1. A. TRAVAGLINI, G. VINTI, *A mathematical model for the analysis of eye fundus images in healthy and diabetic patients*, Lecture Notes in Computer Science, 14108, Springer, (2023), 558–576. DOI: https://doi.org/10.1007/978-3-031-37117-2_38
2. A. TRAVAGLINI, G. VINTI, G. B. SCALERA, M. SCIALPI, *A large scale analysis for testing a mathematical model for the study of vascular pathologies*, Mathematics, 11 (8), Art. Number 1831 (2023). DOI:

<https://doi.org/10.3390/math11081831>

3. D. COSTARELLI, M. SERACINI, A. TRAVAGLINI, G. VINTI, *Alzheimer biomarkers esteem by sampling Kantorovich algorithm*, Mathematical Methods in the Applied Sciences, 46 (12) (2023), 13506–13520. DOI: <https://doi.org/10.1002/mma.9268>
4. M. LONGARONI, L. RINELLI, A. TRAVAGLINI, G. VINTI, *Mathematical models and algorithms for processing retinal OCTA images*, Lecture Notes in Computer Science, 15892, Springer, (2025), 358–378. DOI: https://doi.org/10.1007/978-3-031-97638-4_23
5. A. M. ACU, M. ILINA, F. SOFONEA, A. TRAVAGLINI, G. VINTI, *A comparison between neural network and sampling Kantorovich operators in terms of image denoising*, Lecture Notes in Computer Science, 15892, Springer, (2025), 379–399. DOI: https://doi.org/10.1007/978-3-031-97638-4_24
6. M. CAPPELLETTI MONTANO, V. LEONESSA, A. TRAVAGLINI, *On the approximation properties of generalized Gamma-type operators in several function spaces*, Annals of Functional Analysis, 16 (59) (2025). DOI: <https://doi.org/10.1007/s43034-025-00453-1>
7. L. RINELLI, A. TRAVAGLINI, N. VESCERA, G. VINTI, *Sampling type operators versus AI in medical image processing*, Discrete and Continuous Dynamical Systems – Series S, (2025). DOI: <https://doi.org/10.3934/dcdss.2025147>
8. A. TRAVAGLINI, G. VINTI, *Nonlinear sampling Durrmeyer operators: approximation results in function spaces*, Advanced Nonlinear Studies, (2026). DOI: <https://doi.org/10.1515/ans-2023-0210>
9. A.M. ACU, M. STEFANA, A. TRAVAGLINI, G. VINTI., *Nonlinear multivariate sampling Durrmeyer operators: approximation results in function spaces and applications*. Discrete and Continuous Dynamical System Series S (2026). DOI: 10.3934/dcdss.2026108
10. V. LEONESSA, A. TRAVAGLINI, *On a sequence of integral operators associated with power Lindley distribution*, Carpathian Journal of Mathematics, 42 (4) (2026), 807–825.

Submitted Articles

- L. CEDERLE, C. PAGANELLI, A. TRAVAGLINI, F. VAGNARELLI, G. VINTI, *Comparing a Conditional GAN with Sampling Kantorovich Algorithm to Enhance Low-Dose CT Imaging in Lung Cancer Screening*. Submitted (2026).
- A. IULIANO, V. LEONESSA, A. TRAVAGLINI, *On a new generalization of the power Lindley distribution with four parameters*. Submitted (2026).
- V. LEONESSA, A. TRAVAGLINI, G. VINTI *Multivariate generalized Gamma-type operators: approximation results and applications to image processing*. Submitted (2026).
- A.M. ACU, C.D. ALECSA, A. TRAVAGLINI, G. VINTI., *Neural Network and sampling Kantorovich operators vs traditional denoising techniques*. Submitted (2026).

Articles in Preparation

- R. CORSO, A. TRAVAGLINI, G. VINTI, *Approximation properties of the mean sampling Durrmeyer operators*. In preparation (2026).
- M. CAPPELLETTI MONTANO, V. LEONESSA, A. TRAVAGLINI, *On some applications of a modification of Gamma-type operators*. In preparation (2026).

Language and Digital Skills

Native Italian
language

English Advanced level (Listening, Reading, Interaction, Speaking, Writing). First Certificate in English (Council of Europe Level B2) – Cambridge English Language Assessment, May 2016.

██████████ Digital Skills

Advanced knowledge of Microsoft Office, GNU Octave, $\text{\LaTeX}$, MATLAB, GIMP, and others. Programming languages: C, C++. Certificate ICT – European Computer Driving Licence (ECDL), 2013.

Perugia, 15-06-2026

Arianna Travaglini