

Personal data



Academic appointments

Current position

November 1, 2022 – Current **PhD Student in Engineering and Information Science in Engineering and Science**, *University of Siena*, Siena, Italy.

Education

October 1, 2019 – April 22, 2022 **Master Degree in Applied Mathematics**, *University of Siena*, Italy, 110/110 cum laude.

Thesis: “*Combinatorial and Discrete Differential Operators for the Study of Beta-sheets*”, Advisor: Cristiano Bocci.

October 1, 2015 – April 12, 2019 **Bachelor Degree in Mathematics**, *University of Siena*, Italy, 110/110 cum laude.

Thesis: “*Operatori Logici e Reti Neurali*”, Advisor: Luca Chiantini.

September 2010 – July 2015 **Upper secondary school diploma**, *Liceo Scientifico “Galileo Galilei” of Siena*, Italy, 100/100 cum laude.

Awards, Grants and Fellowships

November 1, 2022 – Current **Ph.D. Full Scholarship in Engineering and Information Science in Engineering and Science (XXXVIII cycle)**, *University of Siena*, Siena, Italy.

November 23, 2022 **Best student in Applied Mathematics at DIISM in a.y. 2020-2021 Awarding**, *University of Siena*, Siena, Italy.

Research interests

Applied Algebraic Geometry - Bioinformatics - Machine Learning.

Publications

Peer-reviewed Journals

1. Marziali S., *Boolean operators and neural networks*, Annali dell'Università di Ferrara (2024).
<https://doi.org/10.1007/s11565-024-00541-5>
2. Tanfoni M., Ceroni E. G., Marziali S., Pancino N., Maggini M., Bianchini M., *Generated or Not Generated (GNG): The Importance of Background in the Detection of Fake Images*, Electronics **13**, no. 16, 3161 (2024).
<https://doi.org/10.3390/electronics13163161>
3. Marziali S., Nunziati G., Prete A. L., Niccolai N., Bianchini M., *SADIC v2: A modern implementation of the Simple Atom Depth Index Calculator*, SoftwareX **27** (2024).
<https://doi.org/10.1016/j.softx.2024.101803>.
4. Guerranti F., Mannino M., Baccini F., Bongini P., Pancino N., Visibelli A., Marziali S., *CaregiverMatcher: graph neural networks for connecting caregivers of rare disease patients*, Procedia Computer Science **192** (2021), 1696 – 1704.
<https://doi.org/10.1016/j.procs.2021.08.174>.

Conference Papers

1. Marziali S., Nunziati G., Prete A. L., Niccolai N., Brunetti S., Bianchini M., *A Discrete Geometry Method for Atom Depth Computation in Complex Molecular Systems*, International Conference on Discrete Geometry and Mathematical Morphology (2024), 443–455.
https://doi.org/10.1007/978-3-031-57793-2_34.

Teaching experience

Bachelor and master level

- October 1, 2022 – July 31, 2023 **Teaching Assistant for the Mathematical Analysis 2 undergraduate course (Spring 2023)**, Department of Information Engineering and Mathematics, University of Siena, Siena, Italy.
- October 1, 2022 – June 30, 2023 **Teaching Assistant for the Linear Algebra undergraduate course (Fall 2022, Spring 2023)**, Department of Information Engineering and Mathematics, University of Siena, Siena, Italy.
- October 1, 2022 – June 30, 2023 **Teaching Assistant for the Mathematical Analysis 1 undergraduate course (Fall 2022)**, Department of Information Engineering and Mathematics, University of Siena, Siena, Italy.

Secondary school level

- December 21, 2023 – April 6, 2024 **Teacher of Mathematics, Logic and Physics for the “Corso di preparazione ai test di ammissione e chirurgia a.a. 2023/2024”**, Department of Medicine, surgery and neuroscience, University of Siena, Siena, Italy.

Research Stays

- October 18, 2024 – **Visiting scholar**, *Université Toulouse III - Paul Sabatier*, Toulouse, France
Current Host: Fulvio Gesmundo.
- January 12 – April 4, 2024 **Visiting scholar**, *University of Auburn*, Auburn, Alabama, USA
Host: Luke Oeding.

Conferences, workshops and seminars

Invited talks

- May 29, 2024 **Seminar “Product of Tensors and Description of Networks”**, *within ‘TensorDec group Seminars’*, University of Trento, Trento, Italy.
- March 19, 20, 21, 2024 **Seminar “Product of Tensors and Description of Networks”**, *Johns Hopkins University*, Baltimore, Maryland, USA.
- January 30, 2024 **Seminar “Product of Tensors and Description of Networks”**, *within ‘Auburn Algebra Seminar’*, University of Auburn, Auburn, Alabama, USA.
- November 17, 2023 **Seminar “Product of Tensors and Description of Networks”**, *within ‘Applied Algebraic Geometry 2023-2024 Seminars’*, University of Florence, Florence, Italy.

Conferences

- May 14, 2024 **Contributed talk “Product of Tensors and Description of Networks”**, *‘JM Invariant at 60 - A Conference on Tensor Invariants in Geometry and Complexity Theory’*, Auburn, May 13–17, 2024, Alabama, USA.
- April 18, 2024 **Contributed talk “A Discrete Geometry Method for Atom Depth Computation in Complex Molecular Systems”**, *‘IAPR Third International Conference on Discrete Geometry and Mathematical Morphology’*, Florence, April 15–18, 2024, Italy.

Conferences and workshops: attendance

- July 29 – August 2, 2024 **Effective Methods in Algebraic Geometry – MEGA 2024**, MPI für Mathematik in den Naturwissenschaften Leipzig and Universität Leipzig, Leipzig, Germany.
- June 13, 14, 2024 **II Meeting UMI for Doctoral Students**, Naples, Italy.
- September 18 – 22, 2023 **Third Young Applied Mathematicians Conference**, *University of Siena*, Siena, Italy.
- January 24, 25, 2023 **Workshop on Communicating Mathematics for the Public**, Isaac Newton Institute, Cambridge, UK.

Organiser

- December 4 – 6, 2024 **Organising Committee for the “Learning on Graph Conference 2024 – Italy Meetup”**, *University of Siena*, Siena, Italy, with P. Bongini, F. Costanti, B. Cullen, G. A. D’Inverno, C. Gallegati, C. Graziani, V. Lachi, N. Pancino, F. Pichi.

September 16 – **Organising and Scientific Committee for the “Fourth Young Applied Mathematicians Conference”**, *University of Rome “La Sapienza”*, Rome, Italy, with G. Auricchio, C. Carrara, G. A. D’Inverno, C. Graziani, A. Kushova, G. Loli, A. Marchetti, M. Menci, E. Onofri.

Educational activities

June 10 – 14, 2023 **6th Advanced Course on Data Science & Machine Learning (ACDL)**, *Castiglione della Pescaia (Grosseto)*, Italy.

July 22 – August 16, 2019 **Interuniversity Mathematics Summer School (SMI)**, *Course of Numerical Analysis with Professor Michele Benzi (Scuola Normale Superiore, Pisa, Italy) and final grade A; Course of Differential Geometry with Prof. Liviu Ornea (University of Bucharest, Romania) and final grade B*, Perugia, Italy.

Further information

Professional activities and projects

May 9, 2022 – **Pint of Science**, *Local Team Collaborator*, Siena, Italy.
Current

October 5, 19, 2023 **Rare Disease Hackathon 2023**, *Runner-up team*, Stazione La Leopolda, Firenze, Italy.

November 4, 5, 2020 **Rare Disease Hackathon 2020 (digital edition)**, *Finalist Team*, Stazione La Leopolda, Firenze, Italy.

Computer skills and competencies

- Matlab, Python, Latex, My-SQL
- ECDL Certification June 3, 2014.

Language competences

- Italian: Mother tongue
- English: Proficient, Cambridge C1 Advanced exam in English (CAE), June 2024.

