

Caterina Mazzetti

Curriculum Vitae

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Experience

- Nov. 2024- **Mathematics and Physics professor**, Reggio Emilia.
Present Liceo Blaise Pascal.
- Feb. 2020- **Teaching assistant**, *University of Bologna*, Mathematical Analysis 1 and 2.
Present Faculty of Chemical and Biochemical Engineering (A.Y. 2025-26),
Faculty of Mechanical Engineering (A.Y. 2022-23/24-25),
Faculty of Automation Engineering (A.Y. 2021-22/22-23),
Faculty of Mathematics (A.Y. 2020-21),
Faculty of Electronic and Civil Engineering (A.Y. 2019-20).
Professors in chair: G. Citti, B. Ruffini, F. Uguzzoni, G. Cupini, G. Dore and G. Cupini, V. Martino and M. Franca.
- Oct. 2023- **Mathematics and Physics professor**, Bologna.
Nov. 2024 Liceo Scientifico Giordano Bruno (Sept. 2023 - Nov. 2024)
Liceo Scientifico Statale Enrico Fermi (S.Y. 2023/24).
- May 2018- **Business Intelligence Consultant**, KPMG ADVISORY, Bologna.
Oct. 2019 Maintenance and new developments on Sap Business Warehouse for human resources and financial areas.
- Jan. 2018- **Private Tutor**, MATEMAGIA EDUCATIONAL SERVICES, Bologna.
Apr. 2018 Mathematics and physics lessons to high school students. Tutoring for university admission tests.
- Sept. 2016- **Teaching assistant**, *University of Bologna*, Mathematical Sciences.
Jan. 2017 Faculty of Management and Marketing, Professor in chair: A. Parmeggiani.
- July 2011 **High School Internship**, *Liceo Scientifico Statale E. Fermi*, Bologna.
Researching the school's archives to compile a history storyline for its foundation anniversary celebration.

Education

- Nov. 2019- **Ph.D. in Mathematics**, *Sorbonne Université and University of Bologna*, Cotutelle program.
March 2023 Centre d'analyse et de mathématique sociales (Paris), Dep. Mathematics (Bologna).
Thesis title: Neurogeometry of reaching. Advisors: Professors G. Citti and A. Sarti.
Committee members: Professors O. Faugeras, P. Chossat, T. Flash, B. Perthame, R. Fioresi, D. Barbieri.
Final Assessment: Excellent with honours.
<https://theses.hal.science/tel-04137244>
- Sept. 2015- **Master's degree in Mathematics**, *University of Bologna*.
Dec. 2017 Specialized in mathematical analysis. 110/110 with honours.
Advisor Prof. G. Citti and Co-advisor Doct. E. Baspinar.
- Sept. 2012- **Bachelor's degree in Mathematics**, *University of Bologna*.
Oct. 2015 Thesis in mathematical analysis. Final score 107/110.
Advisor: Prof. A. Montanari.

Talks and Poster Presentations

- 2023 A sub-Riemannian model of the functional architecture of M1 for arm movement direction, GSI'23 6th International Conference on *Geometric Science of Information*, Saint-Malo, on August 30 - September 01.
- 2023 A Sub-Riemannian model of M1 cells encoding movement fragments, Poster session, *Sub-Riemannian Geometry, Harmonic Analysis, PDEs and Applications*, Bologna, July 03-05.
- 2022 A mathematical model of the motor cortex, Poster session, *European Researchers' Night*, Bologna, September 30.
- 2020 Some applications of the fractional laplacian operator - extension problems, *Department of Mathematics*, Bologna, September 11.

Publications and preprints

- 2025 Mazzetti, Ali, Sarti, Citti, *A sub-Riemannian model of neural states in the primary motor cortex*. Mathematical Neuroscience and Applications, 6 (Applications). <https://mna.episciences.org/18599/pdf>.
- 2023 Mazzetti, Sarti, Citti, *A Sub-Riemannian Model of the Functional Architecture of M1 for Arm Movement Direction*. In: Nielsen, F., Barbaresco, F. (eds) *Geometric Science of Information. GSI 2023. Lecture Notes in Computer Science*, vol 14072. Springer, Cham. https://doi.org/10.1007/978-3-031-38299-4_50
- 2023 Mazzetti, Sarti, Citti, *A model of reaching via subriemannian geodesics in Engel-type group*, <https://arxiv.org/pdf/2301.05765.pdf>.
- 2022 Mazzetti, Sarti, Citti, *Functional architecture of M1 cells encoding movement direction*. *Journal of Computational Neuroscience* 51, 299–327 (2022). <https://doi.org/10.1007/s10827-023-00850-2>.

Competitions

- 2024 Winner of the ordinary competition for secondary school, class of competition A027 (Mathematics and Physics), Emilia Romagna.

Awards

- 2017 Two Emil Banca Scholarships for best achievements in A.Y. 2016-17 and S.Y. 2007- 08.
- 2013 University of Bologna Scholarship for best achievements in A.Y. 2012-2013

Computer skills

Basic	PYTHON, MATHEMATICA
Intermediate	MATLAB, $\text{\LaTeX}$, MICROSOFT OFFICE, SQL
Advanced	SAP Business Warehouse

Languages

Italian	Mothertongue
English	Good command/good working knowledge
French	Good command/good working knowledge

Miscellaneous

- 2005 - Present Volleyball and beach volleyball player (Fipav/Aibvc).