

Reinaldo Resende (Last updated: Nov 1st, 2024)

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🗣️ Portuguese(Native), English(fluent), Italian(intermediate)



Academic appointments

Employment history

Sep/23 – 📅 Postdoctoral Associate at Carnegie Mellon University (CMU).
Mentor: *Robin Neumayer*.

Education

Ago/19 – Jul/23 🎓 Ph.D. in Mathematics at University of São Paulo (USP).
Scholarship: *CAPES - 88882.377954/2019-01*.
Advisors: *Stefano Nardulli and Camillo De Lellis*.

Ago/17 – Jul/19 🎓 Master Degree in Sciences at University of São Paulo (USP).
Scholarship: *CNPq - 166204/2017-0*.
Advisors: *Stefano Nardulli and Gláucio Terra*.

Jan/14 – Jul/17 🎓 Bachelor Degree in Mathematics at University of São Paulo (USP).
Advisor: *Gláucio Terra*.

Research visits

Apr/24 📅 Visiting Scholar. Institute for Advanced Study (IAS).

Jan/23-May/23 📅 Visiting Student Research Collaborators (VSRC). Princeton University.

Sep/22-Dec/22 📅 Thematic Program on Nonsmooth Riemannian and Lorentzian Geometry, Visiting Research. Fields Institute.

Funding and Awards

Awards

Oct/24 🏆 USP 2024 Thesis of Distinction in STEM fields (\approx \$2300).

Sep/24 🏆 Gutierrez Prize 2024 (\approx \$500).

🏆 Honorable mention in the CAPES Thesis Prize.

Grants

Jan/24-Dec/25 💰 Co-PI: CNPq - 441922/2023-6 (\approx \$20,000).

Jul/23-Oct/26 💰 Co-PI: FAPESP - 2021/05256-0 (\approx \$300,000).

Research publications

Preprints

① Fleschler, I., & Resende, R. (2024). *On the regularity of area minimizing currents at boundaries with arbitrary multiplicity*. arXiv: 2410.04566

- ② Nardulli, S., & Resende, R. (2024a). *Interior regularity of area minimizing currents within a $C^{2,\alpha}$ -submanifold*. arXiv: 2404.17407
- ③ Resende, R. (2023a). *Lipschitz approximation for general almost area minimizing currents*. arXiv: 2306.12530

Journal papers

- ① Andrade, J. H., Conrado, J., Nardulli, S., Piccione, P., & Resende, R. (2024). Multiplicity of solutions to the multiphasic Allen-Cahn-Hilliard system with a small volume constraint on closed parallelizable manifolds. *Journal of Functional Analysis (JFA)*.
- ② Nardulli, S., & Resende, R. (2024b). Density of the boundary regular set of 2d area minimizing currents with arbitrary codimension and multiplicity. *Advances in Mathematics (AiM)*.
- ③ De Rosa, A., & Resende, R. (2023). Boundary regularity for anisotropic minimal Lipschitz graphs. *Communications in Partial Differential Equations (CPDE)*.
- ④ Resende de Oliveira, R. (2022). On Clusters and the Multi-isoperimetric Profile in Riemannian Manifolds with Bounded Geometry. *Journal of Dynamical and Control Systems (JDCS)*.

Academic texts

- ① Resende, R. (2023b). *Some regularity results in geometric measure theory* (PhD thesis).
- ② Resende, R. (2019). *Regularity of almost minimizing sets* (Master thesis).
- ③ Resende, R. (2017). *Minimal and maximal surfaces* (Bachelor thesis).

Service and mentoring

Advising

- Ongoing ✓ Co-advisor of the PhD students *Angélica Ponciano*, *Bruno Almeida*, *Marcos Agnoletto* and *Victor Vergara* at the Federal University of ABC.

Mentoring

- Summer 24 ✓ Advisor of the Summer Experiences in Mathematical Sciences (SEMS) program entitled: "One-dimensional Calculus of Variations". Also mentoring *Brian Park* and *Eden Cen* under the Summer Undergraduate Research Apprenticeship (SURA). Both programs took place at Carnegie Mellon University.

Refereeing

- Ongoing ✓ Referee for the following journals.
Journal of Functional Analysis, *Calculus of Variations and Partial Differential Equations*, *Proceedings of the International Geometry Center*.

Organizing Committees

- 2025 ✓ Session 3: Geometric Variational Problems in Smooth and Nonsmooth Metric Spaces, University of Miami, USA.
- 2024 ✓ Bridging Borders: International Geometric Analysis, University of São Paulo, Brazil.
- 2023 ✓ Thematic Session on Geometric Measure Theory, IMPA, Brazil.

Events attended

Talks

- 2024  CRANED # 8 at PUC-Rio.
-  Gutierrez Prize 2024 Ceremony at ICMC, USP-São Carlos.
-  1st International AMS-UMI Joint Meeting, Special Session: Advances in variational methods and applications at Università degli Studi di Palermo (UniPa).
- 2023  Study Guide in Harmonic Analysis Writing Workshop at University of Pennsylvania (UPenn).
-  Conferences On Smooth and Non Smooth Geometric Analysis at Federal University of the ABC (UFABC).
- 2022  Isoperimetric Problems at University of Pisa (UniPi).

Seminar Talks

- 2024  Nonlinear Analysis Seminar at National Taiwan Normal University.
-  Math Seminar at Federal University of ABC (UFABC).
- 2023  Math Seminar at Federal University of ABC (UFABC).
-  CNA Seminar at Carnegie Mellon University (CMU).
-  PDE-Applied Math Seminar at University of Maryland (UMD).

Research schools

- 2022  Hausdorff School on Geometric Analysis and Nonlinear Partial Differential Equations at Hausdorff Center for Mathematics (HCM).
-  CIMPA Research school: Singularities and Applications at University of São Paulo (USP), Campus São Carlos.

Conferences, symposiums and workshops

- 2024  Geometric Measure Theory and applications at Palazzone SNS in Cortona.
- 2023  Workshop on Advising and Mentoring Graduate Students and Postdocs at Rice University.
-  Rutgers Geometric Analysis Conference at Rutgers University.
-  37th Geometry Festival at Princeton University.
-  Recent trends in nonlinear and geometric analysis at CUNY Graduate Center.
- 2022  Point Configurations: Deformations and Rigidity at University College of London (UCL).
-  Shape Optimization, related topics and applications at Roscoff Biological Center, France.
- 2019  Workshop on Submanifold Theory and Geometric Analysis at Federal University of São Carlos (UFSCAR).
- 2018  III Brazilian congress of young researches in pure and applied mathematics and statistics at Federal University of Parana (UFPR).
-  Modern Trends in Differential Geometry at University of São Paulo (USP).
-  Symposium in Harmonic Analysis and Geometric Measure Theory at University of São Paulo (USP), Campus Ribeirão Preto.

Teaching

Carnegie Mellon University

- Fall 23 -  21-356 Principles of Real Analysis II (Fall 2023, Spring 2024, and Fall 2024), and 21-127 Concepts of Mathematics (Summer 24).

Teaching (continued)

University of São Paulo

2022 and 2023  Instructor for Summer course: Linear Algebra (Jan/23-Feb/23); and Metric spaces (Jan/22-Feb/22).

Aug/17-Feb/23  TA: Differential and integral calculus I (Mar/22-Jul/22); Differential geometry (Ago/21-Dec/21); Series and differentiable functions (Feb/21-Jul/21); Calculus of multivariable functions II (Aug/20-Dec/20); Differential and integral calculus I (Feb/20-Jul/20); Summer course: metric spaces (Jan/20-Feb/20); Analytic geometry (Feb/19-Jul/19); Summer course: Linear algebra (Jan/19-Feb/19); Measure and integration (Aug/18-Dec/18); Linear algebra II (Feb/18-Jul/18); and Introduction to linear algebra (Aug/17-Dec/17).