

G. Silva

curriculum vitae

Personal Information

Department of Mathematics
Texas A&M University San Antonio
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US Permanent Resident

Education

Ph.D. Mathematics, Washington University in St. Louis, USA, 2012-2016
Thesis title: *On the limiting behavior of variations of Hodge structures.*
Advisor: Matt Kerr
M.A. Mathematics, Washington University in St. Louis, USA, 2014
B.S. Mathematics, Universidade Federal do Piaui, Brazil, 2012

Employment

Assistant Professor, Texas A&M University San Antonio, 2023 -
Assistant Teaching Professor, Eastern Illinois University, USA 2021-2023
Research Associate, Imperial College London, UK, 2016 - 2019

Research Interests

Nonlinear **Elliptic Partial Differential Equations.**

Publications

Research Papers

1. A new proof of the $C^{p'}$ -conjecture in the plane via a priori estimates. **Journal of Differential Equations** (2026). <https://doi.org/10.1016/j.jde.2025.114058>.
2. Quasilinear elliptic equations with superlinear convection. **Journal of Mathematical Analysis and Applications**, 554(1), 130005. (2025) <https://doi.org/10.1016/j.jmaa.2025.130005>.

3. An elliptic equation with power nonlinearity and degenerate coercivity. **Journal of Elliptic and Parabolic Equations** (2025). <https://doi.org/10.1007/s41808-025-00341-8>
4. On an elliptic system with singular nonlinearity. **European Journal of Mathematics** 11, 47 (2025). <https://doi.org/10.1007/s40879-025-00840-x>.
5. (with James Lewis) The complexity of higher Chow groups. **Canadian Mathematical Bulletin**. 2023;66(3):903-911. doi:10.4153/S0008439522000509
6. (with James Lewis) On the Hodge conjecture for complete intersections. **Communications in Algebra**, 52(2), 884–893. <https://doi.org/10.1080/00927872.2023.2252078>
7. (with Tom Coates and Alessio Corti) On the topology of Fano smoothings, Interactions with Lattice Polytopes, **Springer**, 2022.
8. On the monodromy of elliptic surfaces, **Israel Journal of Mathematics**, 2022, DOI: s11856-022-2458-4
9. Known cases of the Hodge conjecture. arXiv (*Not for publication*)
10. Notes on the Hodge Conjecture for Fermat Varieties, **Experimental Results** Volume 2 , 2021 , e22, DOI: 10.1017/exp.2021.14
11. On the arithmetic of Landau-Ginzburg model of a certain class of threefolds, **CNTP** Vol. 13, No. 1, 2019, DOI: 10.4310/cntp.2019.v13.n1.a5
12. (with Matt Kerr and Greg Pearstein) Arithmetic of degenerating principal variations of Hodge structure: examples arising from mirror symmetry and middle convolution. **Canadian Journal of Mathematics** 68, 2014, DOI: 10.4153/CJM-2015-020-4

Preprints

13. An equation involving the 1-Laplacian and a singular nonlinearity. Under peer review.
14. A nonlinear problem related to optimal insulation. Under peer review
15. Quasilinear Hardy-Hénon equation with power source. Under peer review.
16. Continuous weak solutions to the Ideal Hall equation. Arxiv.

Books

17. Real Analysis: Functions of a real variable.
Pre-publication phase: In talks with **Springer Nature**.
(*Draft available online here*)

Teaching Experience

Real Analysis, Texas A&M, Fall 2025
Calculus III, Texas A&M, Fall 2025
Intro to Proofs, Texas A&M, Fall 2025
Mathematics for Bus. and Soc. sciences II, Texas A&M, Spring 2025
Calculus I, Texas A&M, Spring 2025
Real Analysis, Texas A&M, Fall 2024
Intro to Proofs, Texas A&M, Fall 2024
College Alebgra, Texas A&M, Spring 2024
Calculus II, Texas A&M, Spring 2024
College Algebra, Texas A&M, Fall 2023
Differential Equations, Eastern Illinois University, Spring 2023
Calculus I, Eastern Illinois University, Spring 2023
Finite Mathematics, Eastern Illinois University, Spring 2023
Brief Calculus, Eastern Illinois University, Fall 2022
College Algebra, Eastern Illinois University, Fall 2022
Mathematics: A Human Endeavor, Eastern Illinois University, Fall 2022
Calculus I, Eastern Illinois University, Spring 2022
College Algebra, Eastern Illinois University, Spring 2022
Mathematics: A Human Endeavor, Eastern Illinois University, Spring 2022
College Algebra, Eastern Illinois University, Fall 2021
Finite Mathematics, Eastern Illinois University, Fall 2021
Mathematics: A Human Endeavor, Eastern Illinois University, Fall 2021
Algebraic geometry, Imperial College London, Spring 2019

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Smooth Manifolds, Imperial College London, Fall 2017

Calculus II, Washington University, Spring 2015

Calculus I, Washington University, Fall 2013

Calculus for Economics II , UFPI, Brazil, Spring 2012

Advising Undergraduate Research Projects

James Lawrence (2018-2019), Imperial College London

Project: *The mirror map and its applications.*

Guillermo Ayuso (2018-2019), Imperial College London

Project: *Hodge theory applications in Mirror symmetry.*

Gabriel Kassayie (2018-2019), Imperial College London

Project: *Lefschetz theorem on algebraic cycles.*

Tanuj Gomez (2017-2018), Imperial College London

Project: *Complex Manifolds and Sheaf Cohomology.*

Professional Service

Referee for Journal of the London Mathematical Society

Referee for Indiana University Mathematics Journal

Reviewer for Mathematical Reviews

Departmental Service: Texas A&M San Antonio

Curriculum development committee.

Academic Distinguished Student Award Committee

Data Analysis for the College of Education

Science Olympiad event coordinator

Selected Invited talks

On the C^p -conjecture in the plane, 10th Coastal Bend Mathematics and Statistics Conference, Texas A&M Corpus Christi, TX

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The Hodge Conjecture: a million dolar probelm!, EIU Mathematics Colloquium, US.

On the complexity of Higher Chow Groups, WUSTL Algebraic Geometry Seminar, US.

Hodge Conjecture For Fermat Varieties, WUSTL Algebraic Geometry Seminar, US.

On the geometry of Elliptic surfaces, Brazilian Algebraic Geometry Seminar.

Surfaces with Exceptional monodromy, Cambridge-Oxford-Warwick seminar, UK.

Mirror symmetry and CY variations, Nottingham, UK.

On the arithmetic of Landau-Ginzburg models of a certain class of threefolds, Imperial College London, UK.

Surfaces with Exceptional monodromy, FRG workshop, Stony Brook, US.

LG-models, regulators and normal functions, Workshop on Arithmetic and Geometry of Algebraic Varieties, Fields Institute, Toronto, Canada.

Awards & Grants

Pending

NSF Grant RUI: Regularity, Singular Limits, and Shape Optimization in Nonlinear Elliptic Equations \$199,034

Awarded

Summer Grant Fellowship, \$5000, Texas A&M San Antonio, 2026

Student Academic Choice Award nomination for Best Teaching for Undergraduates, Imperial College, 2018

Washington University Graduate Fellowship, 2012-2016

Science without borders grant, ~\$120,000, Brazilian National Science Foundation, 2012-2016

REUNI UROP grant, \$3600, Universidade Federal do Piaui, Brazil, 2012

Milenio Young scientist fellowship, IMPA, Brazil, 2009-2010

1st place out of > 300 at B.S. Mathematics selection process, Universidade Federal do Piaui, 2008.