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. A nonlinear problem related to optimal insulation. Under peer review - 2025.

6. Quasilinear Hardy-Hénon equation with power source. Under peer review - 2025.

7. An inhomogeneous p-laplacian equation with a Hardy potential. Under peer review - 2024

8. Radially symmetric solutions to a Lane-Emden type system. Under peer review - 2024

9. (with James Lewis) The complexity of higher Chow groups. **Canadian Mathematical Bulletin**. 2023;66(3):903-911. doi:10.4153/S0008439522000509

10. Continuous weak solutions to the Ideal Hall equation. Preprint (available online)

11. (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`

12. (with Tom Coates and Alessio Corti) On the topology of Fano smoothings, Interactions with Lattice Polytopes, **Springer**, 2022.

13. On the monodromy of elliptic surfaces, **Israel Journal of Mathematics**, 2022, DOI: s11856-022-2458-4

14. Known cases of the Hodge conjecture. arXiv *(Not for publication)*

15. Notes on the Hodge Conjecture for Fermat Varieties, **Experimental Results** Volume 2 , 2021 , e22, DOI: 10.1017/exp.2021.14

16. 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

17. (with Matt Kerr and Greg Pearstein) Arithmetic of degenerating principal variations of Hodge structure: examples arising from mirror symmetry and middle convolution. **Cana-**

dian Journal of Mathematics 68, 2014, DOI: 10.4153/CJM-2015-020-4

Books

18. 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

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 cyles.*

Tanuj Gomez (2017-2018), Imperial College London
> Project: *Complex Manifolds and Sheaf Cohomology.*

Professional Service

Referee for Journal of the London Mathematical Society

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

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.

Math circle, *Coloring graphs, part II*, Washington University, US.

Math circle, *Coloring graphs*, Washington University, US.

On the Hodge conjecture for Abelian varieties, Washington University, US.

A survey of Monodromy, Undergraduate Colloquium, Universidade Federal do Piaui, Brazil.

The Hopf-Fibration, Seminar, Universidade Federal do Piaui, Brazil.

Yoneda's lemma, Seminar, Universidade Federal do Piaui, Brazil.

Awards & Grants

Pending

NSF Analysis Program Standard Grant $163,123

Awarded

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

Washington University Graduate Fellowship, 2012-2016

Science without borders grant, around $120.000, Brazilian National Science Foundation, 2012-2016

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

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

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