



HERNAN IRIARTE




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WORK EXPERIENCE

- Nov 2024 - Now **AI Researcher**, ReplAI  Chile
Development and implementation of a predictive model for money laundering detection for Banco Estado.
- 2022-Julio 2024 **Postdoctoral Researcher**, University of Texas at Austin  USA
Researcher in the Department of Mathematics at the University of Texas at Austin and lecturer at the College of Natural Sciences of the university.
- 2021-2022 **Research and Teacher (ATER)**, Sorbonne Université  France

EDUCATION

- 2022 **PhD in Mathematics**, École Polytechnique / Sorbonne Université.  France
- 2018 **Master 2 in Mathematics**, Sorbonne Université.  France
- 2017 **Master in Mathematics**, Instituto de Matemática Pura e Aplicada (IMPA).  Brazil
- 2017 **Bachelor in Applied Mathematics, Specialization in Computer Science**, Universidade Federal de Rio de Janeiro.  Brazil

SHORT TRAINING AND BOOTCAMPs

- 2024 Sept **SPAR : Supervised Program for AI Alignment**. A 3-month research workshop on a project related to interpretability in artificial intelligence models. Mentor : Juan Felipe Cerón Uribe, OpenAI.
Mentor : Lucius Bushnaq, Apollo Research.
Project : Approximating the Local Learning Coefficient in Neural Networks. See here.
- 2024 July **AI Safety Fundamentals**. A 3-month course on new techniques in artificial intelligence and its risks, Blue-Dot Impact.
Mentor : Juan Felipe Cerón Uribe, OpenAI.

CODING SKILLS

- > Python (PyTorch, TensorFlow, JAX, NumPy, Pandas, Polars), Jupyter notebooks, Matlab, Sagemath, Polymake, \LaTeX , C++, R, SQL, HTML, CSS, Jekyll, Typescript, Git, AWS (S3, Sagemaker).

EVENT MANAGEMENT

- > **2023** : Co-organizer of the Geometry Seminar. Department of Mathematics at the University of Texas at Austin. Austin, USA.
- > **2018-22** : Co-organizer of the REGA Seminar (Réseau des étudiants en Géométrie Algébrique). Institut Henri Poincaré, Paris, France

DIRECTED THESES AS AN ADVISOR

- > **2022** : **Jaime Ignacio Tobar**. Thesis for the degree of Mathematical Engineer, USACH. Highest honors.
Area : Applied mathematics and Microeconomics.
Title : Higher Rank Tropical Geometry For Analyzing Demand In Case Of Disturbances. (Original : Geometría Tropical de Rango Mayor Para Analizar la Demanda Ante Perturbaciones.)

PUBLICATIONS

- > **2023** : Higher Rank Polyhedral Geometry, Preprint
- > **2023** : Geometry of Higher Rank Valuations. joint with Omid Amini, submitted to Annales de l'institut Fourier
- > **2022** : Polyhedral, Tropical and Analytic Geometry of Higher Rank, PhD thesis

★ AWARDS AND SCHOLARSHIPS

- > **2022-24** : Postdoctoral Fellowship, National Science Foundation NSF, United States.
- > **2018-21** : PhD Scholarship, Fondation Sciences Mathématiques de Paris, France
- > **2017-18** : Master's Scholarship, Fondation Sciences Mathématiques de Paris, France
- > **2014-16** : Master's Scholarship, Commission Nationale de Recherche, CNPq, Brasil.
- > **2013** : Summer Program Scholarship, Instituto de Matemática Pura e Aplicada. IMPA.
- > **2012-13** : Andrónico Luksic Scholarship for Mathematical Talent, Andrónico Luksic Foundation.
- > **2012** : First Place and Gold Medal, National Mathematics Olympiad, Chilean Mathematical Society.
- > **2012** : Gold Medal, School Mathematics Championship CMAT.
- > **2012** : Top National Score in Mathematics, University Selection Test, DEMRE.

✈ ACADEMIC VISITS

- > **2023** : 5 month academic visit to the mathematics department of Stanford University for the Spring semester. Invited by Ravi Vakil. Palo Alto, California, USA.
- > **2021** : Academic visit during November to the mathematics department of the Technical University of Berlin. Invited by Michael Joswig. Berlin, Germany.

🗣 TALKS

- > **2024** : Joint Mathematics Meetings 2024 - Title : *Weak continuity on the variation of Newton-Okounkov bodies*.
- > **2023** : SIAM Texas-Louisiana. Lafayette, LA, United States. - Title : *Higher Rank Tropical Geometry in Microeconomics*
- > **2023** : Conference : AGREGA 2. Universidad Santa Maria, Valparaiso, Chile. - Title : *Weierstrass cycles and their equidistribution*
- > **2023** : Conference : Newton-Okounkov Bodies and Tropical Geometry. Goethe University Frankfurt, Alemania. - Title : *Geometry with higher rank valuations*
- > **2023** : Seminar on Algebra and Combinatorics, Tulane University, New Orleans, USA. - Title : *Higher Rank Tropical Geometry*
- > **2023** : Seminar on Nonlinear Algebra, Max Planck Institute, Leipzig, Alemania. - Title : *Higher rank tropical and polyhedral geometry*
- > **2023** : Stanford Algebraic Geometry Seminar. Stanford University, Palo Alto, USA. - Title : *Weak variation of Newton-Okounkov bodies*
- > **2023** : Algebra Seminar. University of California Los Angeles, Los Angeles, USA. - Title : *Geometry with higher rank valuations*
- > **2022** : Conference : Non-Archimedean and Tropical Geometry. University of Regensburg, Regensburg, Alemania - Title : *Higher Rank Tropical Geometry*
- > **2022** : Seminario de Geometría Algebraica. Universidad Catolica de Chile, Santiago, Chile - Title : *Geometría con valuaciones de rango superior*
- > **2022** : Geometry Seminar, The University of Texas at Austin, Austin, USA. - Title : *Geometry with higher rank valuations*
- > **2022** : Séminaire DGeCo. Sorbonne Université, Paris, France. - Title : *Higher rank polyhedral geometry*
- > **2022** : Séminaire de géométrie, École Polytechnique, Palaiseau, France. - Title : *Higher rank polyhedral geometry and applications*
- > **2021** : Réseau des Étudiants en Géométrie Algébrique. Institut Henri Poincaré, Paris, France - Title : *Geometry of Higher Rank Valuations*
- > **2021** : Student Algebraic Geometry and Foliations Seminar. IMPA, Rio de Janeiro, Brasil. - Title : *Geometry of Higher Rank Valuations*

+ OUTREACH AND VOLUNTEERING

- > **Since 2017** : Coach of the Chilean Mathematics Team for International Olympiads, Chilean Mathematical Society.
- > **2021** : Talk "Théorie des graphes et coloration des cartes", Science Festival, École Polytechnique, Palaiseau, France.
- > **2019** : Talk "Cortando poliedros, el Tercer problema de Hilbert", Alicante del Sol School, Santiago, Chile.
- > **2017** : Talk "Clasificando teselaciones", Mathematics Week, Don Orione School, Quintero, Chile.

💬 LANGUAGES

Spanish : Native

English : Fluent

Portuguese : Advanced

French : Advanced.