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Education

Universidad del Valle de Guatemala

Bachelor's Degree in Applied Mathematics (Average 97 / 100)

Scheduled December 2025

Guatemala City, Guatemala

- **Relevant content:** Measure Theory, Functional Analysis, Mathematical Statistics, Complex Analysis, Real Analysis, Abstract Algebra, Partial Differential Equations, Ordinary Differential Equations, Numerical Methods, Statistical Learning, Linear Algebra, Euclidean Geometry

Academic Positions - Professional Experience

International Community of Mathematicians (ICMAM) Latin America

Jun 2024 - Present

Young Researcher

- Researched the continuity properties of toroidal pseudo-differential operators on function spaces such as (weighted) Lebesgue spaces, Hardy spaces, Sobolev spaces, and Besov spaces. Advised by Dr. Duván Cardona

Center of Studies in Applied Informatics - Universidad del Valle de Gua.

Research intern

Feb 2025 – present

Guatemala City, Guatemala

- Implementing algorithms to do operations on Linear Graphs
- Develop models to extract information on Linear Graphs

Village School

High School Math Teacher

Jul 2024 – Jun 2025

Guatemala City, Guatemala

- Planning and executing 25 hours per week of classes for three sections of Geometry and one of Statistics for a total of around 50 students
- Evaluation and reinforcement of students and responsible for reporting to parents

Universidad del Valle de Guatemala

Teaching Assistant

Jan 2022 – present

Guatemala City, Guatemala

- I answered questions and graded assignments and exams for students in the following courses: Calculus III (vector calculus) for two semesters, Physics II (rotational dynamics) for one semester, Differential Equations II (partial differential equations) for one semester and Analysis of the Real Variable I (continuity and differentiation of real functions) for one semester.

Universidad del Valle de Guatemala

Laboratory Assistant

Jun 2022 – Jun 2024

Guatemala City, Guatemala

- I prepared the equipment for laboratory experiments, demonstrated their correct execution, and graded laboratory reports for the following courses: Physics I (linear dynamics) for one semester and Physics II (rotational dynamics) for one semester.

Scientific publications

- **Estimates for pseudo-differential operators on the torus revisited. I** (with Duván Cardona), to appear in Journal of Mathematical Analysis and Applications, online version available at <https://doi.org/10.1016/j.jmaa.2025.129959>
- **Boundedness of pseudo-differential operators on the torus via kernel estimates** (with Duván Cardona), to appear in Trends in Mathematics, Birkhäuser, 2025.
- **Estimates for pseudo-differential operators on the torus revisited. II** (with Duván Cardona), submitted for review, preprint at arxiv:2505.01573
- **Boundedness of toroidal pseudo-differential operators on Hardy spaces** (with Duván Cardona), to appear in Trends in Mathematics, Birkhäuser, 2025.
- **Estimates for pseudo-differential operators on the torus revisited. III** (with Duván Cardona), submitted for review, preprint at arxiv:2508.13338

Scientific extension

- **Mexican Mathematical Society Congress 2025** speaker with the research presentation titled "Pseudo-differential operators on the torus", where my work with Duván Cardona is presented
- **Latinamerican Seminar of Mathematics UMALCA-ICMAM** Organizing committee member
- **Newsletter UMALCA-ICMAM** Editorial board member
- **ICMAM Satellite Conference in Analysis and PDE** Junior organizing committee member
- **International Community of Mathematicians (ICMAM) Latin America** scientific board member
- **10th Student Congress on Mathematics and Physics** speaker with the informative talk "Limits", in which fundamental definitions of Category Theory are explored

Awards and Scholarships

- **EMALCA - eIENA X - Argentina 2025** scholarship recipient to participate in the school. Here we discussed Cluster Algebras, Computational Commutative Algebra, Ehrhart Theory, Persistent Homology, Lie Transformers, Representations of Finite Groups, Deformation of Algebras and Hochschild Cohomology
- **EMALCA - Ecuador 2025** scholarship recipient to participate in the school. Here we discussed Differential Galois Theory, Numerical methods for Dynamical Systems, Clifford Algebras, and Graph Theory
- **EMALCA - Honduras 2025** scholarship recipient to participate in the school. Here we discussed Control Theory, Statistical Learning, High dimensional Statistics and Integer optimization
- **Ibero-American Olympiad of University Mathematics** winner of the Bronze Medal at the OIMU edition held in 2023
- **XXIII Summer School in Mathematics, UNAM, Morelia** scholarship recipient from the Center for Mathematical Sciences of UNAM, Morelia. In this edition, the topics discussed were Geometric Group Theory, Maps on surfaces, Algebraic counting methods, Algebraic geometry, Topological Data Analysis
- **Academic Merit Honor 2024, 2023, 2022 and 2021** awarded for obtaining an average greater than 95/100 during the academic year. The specific results are: 96, 97, 98 and 96.
- **Science Leadership Scholarship 2021** to study Applied Mathematics at the Universidad del Valle de Guatemala.
- **National Science Olympiad** Gold Medal (1st place) in Mathematics 2020, Honorable Mention (5th place) in Physics 2019, Bronze Medal (3rd place) in Mathematics 2018 and Honorable Mention (4th place) in Mathematics 2017.
- **Talent Retention Program 2017** from the Guatemalan Olympic Committee for being a promising athlete.

Extracurriculars

International Community of Mathematicians (ICMAM) Latin America

Jan 2025 – present

Scientific committee member

- Updating and maintaining ICMAM Central America and Caribbean's website. Supporting the coordination of satellite congress.

Guatemalan Institute of Radio Education (IGER)

Jan 2022 – Dec 2022

Tutor (Volunteer)

Guatemala City, Guatemala

- Coordinated a group of three tutors to conduct a weekly online precalculus class to a group of approximately 40 adults seeking to complete their high school studies by maturity

Club Leones

2012 – 2024

Competitive basketball player

Guatemala City, Guatemala

- Currently playing in the top flight of the Metropolitan League and in the Guatemalan National Under-23 League.
- Member of the U-17 national team in 2019
- Winner of a total of 7 Guatemalan National Leagues in the categories: U-14, U-16, U-18 and U-23 between 2014 and 2024.

Certifications

- **Applied Data Science in Python** University of Michigan Specialization on Coursera 2020.
- **Mathematics for Machine Learning** Imperial College London Specialization on Coursera 2020.
- **Statistics with Python** University of Michigan Specialization on Coursera 2020.
- **Big Data** University of California San Diego Specialization on Coursera 2020.
- **Reinforcement Learning** Alberta University Specialization on Coursera 2020.

Languages

- **Spanish** native
- **English** C1 level
- **German** B1 level