Diego Díaz

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Research Interests

I am interested in Algebra, in particular Representation Theory and its interactions with Lie Theory, Harmonic Analysis and Number Theory.

Education

Pontificia Universidad Javeriana, Bogotá, Colombia

B.Sc. in Pure Mathematics (with Honors), September 2023
Cummulative GPA: 4.42/5.0
Department of Mathematics

Honors Thesis: *An uncertainty principle for functions with symmetries over finite fields*
Advisor: Jesús Alonso Ochoa Arango

B.Sc. in Electronic Engineering, September 2022
Cummulative GPA: 4.08/5.0
Department of Electronic Engineering

Honors Thesis: *Piecewise linear signals for analog order filters*
Advisors: Alfredo Restrepo Palacios and Jesús Alonso Ochoa Arango

Preprints

On an uncertainty principle for small index subgroups of finite fields
(with Jesús Alonso Ochoa Arango)
arXiv:2310.09992 (2023), submitted to the journal Finite Fields and Their Applications.

Honors and Awards

Xaverian order of academic merit
Mathematics program, Pontificia Universidad Javeriana, 2023
Recognizes undergraduate and graduate students who have achieved an outstanding final cumulative weighted average, set by the Faculty Council and approved by the Academic Vice-Chancellor.

Honorable mention to the best final cumulative weighted average
Mathematics program, Pontificia Universidad Javeriana, 2023

Honorable mention for undergraduate thesis
Mathematics program, Pontificia Universidad Javeriana, 2023

Honorable mention for undergraduate thesis
Electronic Engineering program, Pontificia Universidad Javeriana, 2022

Talks

Interuniversity Mathematics Conference (Universidad Nacional de Colombia), April 2023
Speaker: *An uncertainty principle for functions with symmetries*.

Seminars and Schools

Seminars at Pontificia Universidad Javeriana

Lie Groups and Symmetric Spaces: Followed the book *Lie Groups: Beyond an Introduction* by Knapp
Directed by Jesús Ochoa and Juan Sebastián Rodriguez
Topics: Lie groups and Lie algebras, homomorphisms, structure theorems, complex semisimple Lie algebras, representation theory.

Algebra and Category Theory: Followed the book *An introduction to Homological Algebra* by Weibel
Directed by Claudia Gallego
Topics: modules and tensor products, categories, functors, natural transformations, colimits.

Control Theory: Followed the book *Mathematical Control Theory* by Zabczyk
Directed by Leoncio Quiñones and Edwin Murcia
Topics: general functional analysis, controllability matrix, rank condition, clasf. of control systems, Kalman decomposition, observability.

Lie Theory: Followed the book *Symmetry, Representations and Invariants* by Goodman and Wallach
Directed by Jesús Ochoa and Juan Sebastián Rodriguez
Topics: Lie groups, classical Lie algebras, closed subgroups of $\mathbf{GL}(n, \mathbb{R})$, linear algebraic groups, rational representations.

Summer Schools Attended

Colombian Combinatorial Meeting (ECCO), Universidad de los Andes, Universidad Sergio Arboleda, Bogotá 2022.
CIMPA Research School: Geometric methods in combinatorics
Topics: combinatorial convex geometry, combinatorial subvarieties of the flag variety, real tropical geometry and chip-firing, additional `SageMath` sessions.

Other Experiences

Mathematics Tutor for the Department of Mathematics, Pontificia Universidad Javeriana, 2022
Assistant for all majors: calculus, linear algebra, probability and discrete mathematics.

Mentor for Electronic Engineering Undergraduates, Pontificia Universidad Javeriana, 2021
Mentor in mathematics courses for students in the first semesters of electronic engineering.

Data Science Internship, Management Solutions, 2023
Project for BBVA bank on data engineering with big data tools for financial and risk analysis.

Relevant Skills

Programming: Python, C, `SageMath`, Matlab, LaTeX, SQL, PySpark.

Languages: Spanish (native), English (fluent), German (basic).