

ALEC S. ZABEL-MENA

alec.zabel@upr.edu azabelmena.github.io github.com/azabelmena

EDUCATION

Universtiy of Puerto Rico, at Río Piedras
Master of Science in Pure Mathematics

August 2022 – December 2025 (Expected)

Universtiy of Puerto Rico, at Río Piedras
Bachelor of Science in Pure Mathematics
Minor in Cybersecurity

August 2016 – June 2022

CAREER OBJECTIVE

To become an academic researcher and professor. Aiming to research both pure and applied mathematics; specifically research in algebraic geometry, coding theory, and other areas of discrete mathematics.

RESEARCH INTERESTS

- Commutative Algebra
- Algebraic Geometry
- Finite Fields
- Graph theory, and Combinatorics
- Matroid theory
- Category Theory and Homotopy Type Theory

PUBLICATIONS

1. Agrinoni, C.A., Janwa, H., Zabel-Mena, A.S. *Absolute Irreducibility of Generalized Trinomials Defined by APN Functions of The Form $g(x) = 2^{2^i e} + h(x)$ over \mathbb{F}_{2^s}* . Springer Proceedings in Mathematics & Statistics, (To be submitted). 2025.

PRESENTED WORKS

1. Zabel-Mena, A.S., Janwa, H. Agrinoni, C.A. *Absolute Irreducibility of Generalized Trinomials Defined by APN Functions of The Form $g(x) = 2^i + h(x)$ over \mathbb{F}_{2^s}* (Contributed Talk). 40th Seminario Interuniversitario de Investigación en Ciencias Matemáticas (SIDIM), Ponce P.R. 2025.
2. Zabel-Mena, A.S., Janwa, H. Agrinoni, C.A. *An Efficient Implementation and Analysis Of Zeta Functions Of APN Curves and Their Protograph LDPC Codes* (Contributed Talk). 39th Seminario Interuniversitario de Investigación en Ciencias Matemáticas (SIDIM), Humacao P.R. 2024.
3. Zabel-Mena, A.S., Janwa, H. Agrinoni, C.A. *An Efficient Implementation and Analysis Of Zeta Functions Of APN Curves and Their Protograph LDPC Codes* (Poster Session). Forward Research and Innovation Summit, San Juan P.R. 2023.

GRANTS AND AWARDS

PR Space Grant Fellowship and Scholarship Program, NASA
Grant No. 80NSSC20M0052

August 2024 – May 2025

Research Assitanship, NASA
Grant No. 80NSSC20M0052

January 2024 – May 2024

Research Assitanship, NASA
Grant No. 80NSSC20M0052

August 2023 – December 2023

PR Space Grant Fellowship and Scholarship Program, NASA
Grant No. 80NSSC20M0052

August 2022 – May 2023

TEACHING AND MENTORING

Proyecto Tutorías DECEP

2020-2021

University of Puerto Rico, Río Piedras

Mathematics tutor

Conducted assessments to identify the educational needs of my students and developed individualized learning plans.

Tasked with providing tutoring services to seven high school students for 10 hours a week in the subjects of Algebra and Pre-Calculus.

Self-Employed

2019-2021

Mathematics tutor

Evaluated students learning styles and provided appropriate techniques for maximizing understanding and minimizing frustration.

Simplified math concepts while coaching students to think critically when problem solving; eventually introducing them to axiomatic systems within mathematics.

Provided tutoring one-on-one to five highschool students in the subjects of Algebra, Pre-Calculus, and Geometry for two times a week, at two hours for each session.

MEMBERSHIPS AND AFFILIATIONS

Consejo General de Estudiantes (UPRRP)

August 2024 – May 2025

Representante ante el Consejo de Estudios Graduados e Investigación

Consejo de Estudiantes de Ciencias Naturales (UPRRP)

August 2024 – May 2025

Representante ante el Decanato de Estudios Graduados e Investigación

Resigned from post.

Asociación Estudiantil de Matemáticas (AeMAT)

August 2019 – Present

Treasurer

August 2025 – May 2026

Post yet to be assumed.

Treasurer

August 2022 – May 2024

Asociación de Estudiantes de Ciencias de Computos (AECC)

August 2025 – May 2026

Lembrança Negra Capoeira

2017 – 2019

Corda Crua-Verde

Senzala Capoeira (Sou Capoeira)

2019 – Present

Corda Crua-Laranja

SKILLS

Languages

English

Spanish

Portuguese

Software

L^AT_EX

C programming

SAGE Mathematics Software

nix