

# 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 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  $g(x) = 2^{2^i} + h(x)$  over  $\mathbb{F}_{2^s}$* . Springer Proceedings in Mathematics & Statistics, (To be submitted). 2025.

## TALKS, SEMINARS, AND COLLOQUIUMS

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). 40<sup>th</sup> 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). 39<sup>th</sup> 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

---

### 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.

## 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

### Asociación Estudiantil de Matemáticas (AeMAT)

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)

2019 – Present

### Lembrança Negra Capoeira

2017 – 2019

Corda Crua-Verde

### Senzala Capoeira (Sou Capoeira)

2019 – Present

Corda Crua-Laranja

## SKILLS

---

### Languages

English

Spanish

Portuguese

### Software

L<sup>A</sup>T<sub>E</sub>X

C programming

SAGE Mathematics Software

nix