Bobby Orozco

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Education

California State University, Fullerton — Fullerton, CA
Bachelor of Arts in Pure Mathematics — August 2023 – Present
GPA: 3.72

Awards and Honors

- Undergraduate Research Recognition, CSUF Department of Mathematics (2025–2026)
- Dean's List, CSUF (Fall 2025)
- Undergraduate Research Recognition, CSUF Department of Mathematics (2024–2025)
- Dean's List, CSUF (Fall 2024)
- Dean's List, CSUF (Spring 2024)

Research Interests

Number Theory, Algebra, Elliptic Curves, Arithmetic Geometry

Research Experience

California State University, Fullerton — Fullerton, CA
Undergraduate Researcher — June 2025 – Present

- Investigating connections between music theory and group theory.

California State University, Fullerton — Fullerton, CA
Undergraduate Researcher — August 2024 – May 2025

- Co-authored research on reconstruction of rational-valued functions over finite Abelian groups using higher autocorrelations.
- Contributed to theoretical bounds on the number of autocorrelations required for reconstruction.

California State University, Fullerton — Fullerton, CA
Undergraduate Researcher — June 2024 – August 2024

- Designed and implemented a genetic algorithm in MATLAB to approximate the summands of exponential sums from a given target value.

Teaching Experience

Apostolic Faith Tabernacle — Whittier, CA
Piano Instructor — January 2023 – Present

- Provide individualized weekly piano instruction with emphasis on gospel and worship music.
- Develop lesson plans tailored to students' technical levels and musical goals.
- Adapt instructional methods based on ongoing student assessment and progress.

Presentations

- "Reconstructing Gridded Data from Higher Autocorrelations"
  - Joint Mathematics Meetings (JMM), 2026
  - Mathematical Association of America Centennial Conference, California State University, Fullerton
  - SIAM Student Research Event, California State University, Fullerton
- Poster presentation on exponential sums research, Joint Mathematics Meetings (JMM), 2025.

Publications and Preprints

- Casper, W. Riley and **Orozco, B.** "Reconstructing Rational-Valued Functions on Finite Abelian Groups with Higher Autocorrelations." *Applied and Computational Harmonic Analysis*, 2026. `https://doi.org/10.1016/j.acha.2026.101908`
- Castillo, B., **Orozco, B.**, and Zepeda, F. "Bits and Primes: Exploring Digits of Prime Numbers in Binary." *DIMENSIONS: The Journal of Undergraduate Research in Natural Sciences and Mathematics*, California State University, Fullerton, Vol. 26 (Spring 2025).

Current Projects

- Investigating relationships between music theory and abstract algebraic structures such as semidirect products and affine transformations.

Conferences Attended

- Joint Mathematics Meetings (JMM), 2025
- Joint Mathematics Meetings (JMM), 2026

Skills

Programming: MATLAB