Sabian Saliasi

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Research interests: Low-Dimensional Topology; Gauge-Theory; Floer Homology

Education

University of Miami, Coral Gables, FL *August 2022 - May 2026*

B.S. in Mathematics (Core Track); Additional Major in Computer Science

GPA: 3.77 Pure Math GPA: 3.94 Mathematics GRE Subject Test: 970 (95th percentile)

Awards & Honors

Departmental Honors in Mathematics; Singer Full Tuition Scholarship; University of Miami Foote Fellow Honors Program; Florida Academic Scholars; President's Honor Roll

Publications & Preprints

- **Cubiquity: Classifying Alternating Double Branched Covers Bounding Rational Balls** (with Jonathan Simone) - Ongoing.
  - Attempting to prove the Greene-Owens conjecture, classifying when the Double Branched Cover of an Alternating Link bounds a rational ball:

$$\Sigma_2(S^3, L) \text{ bounds a } \mathbb{Q}B4 \iff \Lambda(L) \text{ is Cubiquitous.}$$

  - Established algebraic classification of 2-primary cubiquitous lattices: they are those with Smith Normal Form consisting only of 1's and 2's, and admitting a 2-adic splitting $\Lambda \cong \mathbb{Z}^{n-s} \oplus 2\mathbb{Z}^{s}$.
- **X–Plumbings, H–Plumbings, and Rational Homology 4–Balls** (with Jonathan Simone and Wynn Smith) - In preparation / manuscript.
  - Discovered new large infinite families of H and X shaped plumbings that bound $\mathbb{Q}B4's$.
  - Discovered new H shaped plumbing that bounds an Integral Homology B^4.
  - Invited to present research at the 2026 Joint Mathematics Meeting in Washington D.C.

Research Experience

Carnegie Mellon University, SUAMI / REU, Pittsburgh, PA *Summer 2025*

Undergraduate Researcher (Low-Dimensional Topology)

- Studied rational-homology 3-spheres arising from alternating links and plumbings; developed lattice-theoretic obstructions (cubiquity, p-adic splitting) to rational-ball fillings.
- Developed computer programs in Python to filter non-cubiquitous lattices for given plumbings.
- Drafts produced include the cubiquity program for alternating double branched covers and a classification for X/H-plumbings bounding rational balls (see manuscripts above).

Mathematical Coursework

Gradaute:

- **Topology/Geometry:** Character Varities of 3-Manifolds; Algebraic Geometry
- **Algebra/Analysis:** Lie Groups; Measure Theory and Lebsegue Integration I-II

Directed Readings:

- **Topology:** Morse Homology; Algebraic Topology I-II
- **Algebra:** Commutative Algebra and Varieties

Undegraduate:

– **Topology/Geometry:** Differential Topology; Differential Geometry; Point-Set Topology
– **Algebra/Analysis:** Abstract Algebra I–II; Real Analysis I–II; Complex Analysis; Linear Algebra I–II
– **Applied/Computation:** Probability Theory; Numerical Analysis; ODEs; Machine Learning; Mathematical Finance; Abstract Math; Discrete Math; Data Structures and Algorithms

Selected Talks

– X-Plumbings, H-Plumbings and Rational Homology 4-Balls, UM Topology Seminar (2025).
– Dehn Surgery on Familiar Spaces, UM Math Union (2025).

Invited Conferences & Seminars

– *Joint Mathematics Meeting*
– *Topology Seminar*
– *University of Miami Mathematics Union*

Technical Skills

Python (PyTorch, scikit-learn, NumPy, SciPy, Pandas, Matplotlib); R; Java; SQL; LaTeX; Git

Additional Experience (selected)

University of Miami, Mathematics Union *Sep 2023 – Present*
Co-Founder & Vice President

Organized weekly meetings, with over a dozen students in attendance at any given time.

Invited UM Math faculty to give talks on a wide assortment of topics in Mathematics.

Delivered talks on Dehn Surgery, Fundamental Group of Surfaces, Construction of $\mathbb{R}$ using Cauchy Sequences, and others.

Karate Club, University of Miami *September 2023 – Present*
President, Assistant Instructor, Black Belt

Personally instructed +30 UM students in Goju-Ryu Karate, and Japanese Jiu-Jitsu

Alongside main instructor, host self-defense and women's safety seminars for all students

AI Academy, New York, NY *May 2023 – Aug 2023*
Software Engineering Intern

Helped found non-profit, aiming to provide free courses in Mathematics, Computer Science, Machine Learning, and career advice from industry members in active SWE and QF roles

Trained ML models to generate personalized curriculums and make platform engaging for users

Developed backend infrastructure of company website and code base

Trillium Trading, LLC, Miami, FL *Mar 2023 – May 2023*

Facilitate generation of trading strategies of institutional traders, leveraging market research

Authored proprietary research reports, supporting Trillium's trading strategies

Scrape institutional market research t, generating market data analysis and forecasts