

# Shihan Kanungo

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## EDUCATION

Henry M Gunn High School GPA 3.96/4.46W | San José State University (SJSU) GPA 4.0 ..... 2022–2026

## MATHEMATICS RESEARCH (PUBLICATIONS/PREPRINTS)

MIT PRIMES-USA (Representation Theory, 2024; Commutative Algebra, 2023) ..... Cambridge, MA • 2023–25

- Mixed Tensor Products, Capelli Berezinians, and Newton's Formula for  $\mathrm{gl}(m|n)$  (with S. Erat, A. Kannan) [arXiv] (2024)  
Transform. Groups., Submitted. Won USA Bronze medal in Mathematics at S.-T.Yau HS Science Award. Presented at JMM25 PME Contributed Session for Research by Undergraduates. Reference: Dr. Arun Kannan (MIT)
- A weaker notion of the finite factorization property. (with H. Jiang, H. Kim) [arXiv] (2023)  
Commun. Korean Math. Soc. **39** (2024), no. 2, 313–329. Presented at JMM24 AMS-PME, MAA MathFest. Reference: Dr. Felix Gotti (MIT)

San José State University (SJSU) (Number Theory, 2024) ..... San José, CA • 2024

- On Product Formulas of Guillera and Sondow (with J. Schettler) [arXiv] (2024) Reference: Dr. J. Schettler (SJSU)

## EXPOSITORY PAPERS

- David Gale's Subset Takeaway Game, Combinatorial Game Theory ('24)
- Space-Filling Curves, Real Analysis ('24)
- Large Gaps Between Primes, Analytic Number Theory ('24)
- Dynamical Billiards, Ergodic Theory ('24)
- Arithmetic Dynamics, Number Theory ('23)
- Minimal surfaces, Differential Geometry ('22)
- Herbert Wilf's snake-oil method, Generating Functions ('21)
- Mixing-time estimates for riffle shuffle, Markov chains ('20)
- Classifying groups of certain orders, Algebra ('20)

## HONORS & AWARDS

- S.-T. Yau High School Science Award.  
USA Bronze medalist in Mathematics (2024)
- USAPhO Gold Medal (US Physics Team) (2024)
- WSS, World Science Scholar (2024)
- Spirit of Ramanujan \$2k Fellowship (2023)
- USAMTS Gold Medal (2023)
- USAMO (USA Math Olympiad) (2022)
- Math Kangaroo (Level 12) USA rank 4 (2022)

## CAMPS & PROGRAMS

- USAPhO Team Training Camp, Univ. of Maryland. (Jun 2024)
- JMM25 PME Contributed Session. Presenter (Jan 2025)
- MAA MathFest '24 Research in Motion. Presenter (Aug 2024)
- JMM24 AMS-PME Poster Session. Presenter (Jan 2024)
- SWIM 2023, Summer Workshop for Intrepid Mathematicians, MIT.  
Presenter. (Aug 2023)
- The Special Lectures. Kharkiv-Vienna International Science  
School. Invitee. (Aug 2023)

**Technical Skills:** Python, Java, MATLAB,  $\LaTeX$ , spreadsheets.

**Languages:** English (native) & French (beginner).

## MATH COURSES

San José State University (Graduate courses in color)

- A+ MATH 231A Real Analysis Slobodan Simic ..... '24 F
- MATH 231B Functional Analysis Slobodan Simic ..... '25 Sp
- MATH 233A Applied Mathematics I Daniel Brinkmann ..... '25 Sp
- A+ MATH 234 Advanced Dynamical Systems Liam Stanton ..... '24 Sp
- MATH 285A Stochastic Methods Liam Stanton ..... '25 Sp
- A+ MATH 229 Advanced Matrix Theory Wasin So ..... '24 F
- MATH 285M Nonnegative Matrices Wasin So ..... '25 Sp
- A+ MATH 279A Graph Theory Yan Zhang ..... '24 F
- A+ MATH 226 Theory of Numbers Jordan Schettler ..... '24 Sp
- A MATH 39 Linear Algebra I Dashiell Fryer ..... '23 F
- A+ MATH 129B Linear Algebra II Wasin So ..... '24 Sp
- MATH 128B Abstract Algebra II Edgar Bering ..... '25 Sp
- A+ MATH 131A Introduction to Analysis Tim Hsu ..... '24 Sp
- A+ MATH 131B Introduction to Real Variables Tim Hsu ..... '24 F
- A+ MATH 138 Complex Variables Liam Stanton ..... '23 F
- A+ MATH 179 Introduction to Graph Theory Sogol Jahanbekam ... '24 F

Euler Circle (Grades not assigned)

Complex Analysis I & II, Combinatorial Game Theory .... 2024–'25  
Analytic Number Theory, Ergodic Theory, Number Theory .2023–'24  
Differential Geometry, Generating Functions ..... 2021–'22  
Markov Chains, Abstract Algebra, Real Analysis ..... 2020–'21

Art of Problem Solving (AoPS)

Group Theory (A+), Calculus (A+) ..... 2020–23

## MUSIC

- Stanford Jazz Workshop (2024)  
Duke Ellington award; Outstanding Musicianship award
- Northern California Young Talents Competition (2023)  
First place, solo violin classical performance
- Golden State Youth Orchestra (GSYO)
  - Assistant concertmaster. Camilla Kolchinsky Orchestra (2023)
  - Concertmaster. Camerata & Chamber Players Orch. ('20–'22)