

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 (2024 Representation Theory; 2023 Commutative Algebra) Cambridge, MA · 2023–25

- **Mixed Tensor Products, Capelli Berezinians, and Newton's Formula for $gl(m|n)$** (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)
American Mathematical Monthly. Submitted. Reference: Dr. J. Schettler (SJSU)

EXPOSITORY PAPERS

- **David Gale's Subset Takeaway Game**, Combinatorial Game Theory ('24)
- **Space-Filling Curves**, Real Analysis ('24)
- **Chromatic Polynomials**, Graph Theory ('24)
- **Lagrangian and Hamiltonian Mechanics**, Dynamical Systems ('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

- 86th Annual Putnam Competition. Honorable mention ('24)
- S.-T. Yau Science Award. USA Bronze medal in Mathematics ('24)
- USAPhO Gold Medal & US Physics Team (top 20) ('24)
- WSS, World Science Scholar ('24)
- Spirit of Ramanujan \$2k Fellowship ('23)
- USAMTS Gold Medal ('23)
- USAMO (USA Math Olympiad) ('22, '25)
- AIME, 6-time qualifier. 13/15 ('25); 11/15 ('22, '24)
- Math Kangaroo (Level 12) USA rank 4 ('22)

CAMPS & PROGRAMS

- USAPhO Team Training Camp, Univ. of Maryland. (Jun '24)
- JMM25 PME Contributed Session. Presenter (Jan '25)
- MAA MathFest '24 *Research in Motion*. Presenter (Aug '24)
- JMM24 AMS-PME Poster Session. Presenter (Jan '24)
- SWIM23, MIT. Presenter. (Aug '23)
- 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 shown in color)

| | | | |
|----|-------------------------------------------------|------------------|--------------|
| A+ | MATH 231A <i>Real Analysis</i> | Slobodan Simic | '24 F |
| — | MATH 231B <i>Functional Analysis</i> | Slobodan Simic | '25 Sp |
| — | MATH 233A <i>Applied Mathematics I</i> | Daniel Brinkmann | '25 Sp |
| A+ | MATH 234 <i>Advanced Dynamical Systems</i> | Liam Stanton | '24 Sp |
| — | MATH 285A <i>Stochastic Methods</i> | Liam Stanton | '25 Sp |
| A+ | MATH 229 <i>Advanced Matrix Theory</i> | Wasin So | '24 F |
| — | MATH 285M <i>Nonnegative Matrices</i> | Wasin So | '25 Sp |
| A+ | MATH 279A <i>Graph Theory</i> | Yan Zhang | '24 F |
| A+ | MATH 226 <i>Theory of Numbers</i> | Jordan Schettler | '24 Sp |
| A | MATH 39 <i>Linear Algebra I</i> | Dashiell Fryer | '23 F |
| A+ | MATH 129B <i>Linear Algebra II</i> | Wasin So | '24 Sp |
| A+ | MATH 131A <i>Introduction to Analysis</i> | Tim Hsu | '24 Sp |
| A+ | MATH 131B <i>Introduction to Real Variables</i> | Tim Hsu | '24 F |
| A+ | MATH 138 <i>Complex Variables</i> | Liam Stanton | '23 F |
| — | MATH 142 <i>Introduction to Combinatorics</i> | Jesse Geneson | '25 Sp |
| A+ | MATH 179 <i>Introduction to Graph Theory</i> | Sogol Jahanbekam | '24 F |

Euler Circle (Grades not assigned)

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| 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)

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