Shihan Kanungo

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EDUCATION

Henry M Gunn High School GPA 3.96/4.46W | **San Josè 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 $\mathfrak{gl}(m|n)$ (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

- 85th 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 and highest scorer ('23, '25)
- 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)

	Course	Instructor	Term
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
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
—	MATH 142 *Introduction to Combinatorics*	Jesse Geneson	'25 Sp
A+	MATH 179 *Introduction to Graph Theory*	Sogol Jahanbekam	'24 F

Euler Circle (Grades not assigned)

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)