

HRISHI SUNDER

Chicago, IL

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Education

University of Illinois Urbana-Champaign

B.S. Mathematics & Computer Science; GPA: 4.0/4.0

2025 – 2029

Urbana, IL

Hoffman Estates High School

High School Diploma

2021 – 2025

Hoffman Estates, IL

Relevant Coursework

- Abstract Linear Algebra
- Discrete Mathematics
- Data Structures
- Intro to Higher Math
- Differential Equations
- Computer Science II
- Probability & Statistics
- Calculus III
- Computer Science I

Papers & Invited Talks

[1] **Learning Verifiable Mathematical Laws for Scientific Agents via Graph-Hamiltonian World Models**

Hrishi Sunder. *In the 3rd AI for Math Workshop at ICML, 2026.* [PDF](#).

- Introduces graph-local Hamiltonian world models for learning compact, verifiable mathematical laws for scientific agents.
- Reduces finite-basis law learning to ridge regression in the graph-local Hamiltonian dimension and gives finite-horizon planning guarantees with matching lower bounds.
- Validates geometric verification, transition-only behavior, MPC intervention gains, and residual-guided refinement on graph-coupled oscillators and nonlinear pendula.

[2] **A Short Obstruction to Uniform Prime-Gap Asymptotics and the Additive Structure of the Admissible Constants**

Hrishi Sunder, Sourish Kumrawat, and Kireet Cheri. April 2026. [PDF](#); [Lean4 Formalization](#).

- Disproves a uniform interpretation of Erdős Open Problem #1138 using a compressed record-gap obstruction for maximal prime gaps.
- Proves that constants separated by less than one cannot both satisfy the asserted asymptotic; excludes all $0 < C < 1$ by the same obstruction and $C = 1$ using Westzynthius' theorem.
- Combines the obstruction with Tao's difference observation to characterize admissible constants as either trivial or a cyclic lattice $C_0\mathbf{Z}$ under the signed convention.
- Includes a Lean formalization of the core obstruction; additional contributions from Dr. Terence Tao at UCLA and Wouter van Doorn an independent mathematician based in Netherlands.

Experience

YouTube Content Creation

2023 – 2026

- Scaled a technical short-form content channel from 0 to 180,000+ subscribers and 162 million views by reverse-engineering platform recommendation patterns and analyzing viewer-retention data.
- Conducted independent research on dark patterns and retention mechanics using first-party creator-dashboard metrics, including 1.1M+ watch hours.
- Used creator-side data to study social-media recommendation systems and the behavioral impact of optimizing content for retention.

Honors & Awards

• **USA Computing Olympiad, Platinum Division**

Feb. 2026

Qualified for the highest USACO division after scoring 900/1000 in Gold; ranked among the top 1% of competitors globally through self-study in advanced data structures, optimization, and graph theory.

• **YouTube Silver Play Button**

2024

Recognized for scaling a YouTube channel to 180,000+ subscribers; used the channel to generate datasets for HCI research.

Technical Skills

Languages: Python (NumPy, Pandas, SciPy), Lean 4, R, Java, C++, LaTeX, Wolfram Mathematica.

Mathematics: Formal logic, graph theory, number theory, differential equations, multivariable calculus, numerical methods, probability.

Machine Learning: PyTorch, OpenAI Gymnasium.

Developer Tools: Bash/Zsh, API integration, Git.

Service

ICML Peer Review

2026 – Present

- Peer reviewer for the AI4Math Workshop.

High School Mathematics Tutor, Hoffman Estates High School

2024 – 2025

- Tutored 8–10 students per week in geometry, elementary statistics, calculus, and multivariable calculus.

Community Service Volunteer

2021 – 2025

- Completed 200+ service hours through Feed My Starving Children, local shelters, food drives, and highway cleanups.