Holden Mui

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Education

Massachusetts Institute of Technology: class of 2025 *Aug. 2021 - present*

Mathematics major and physics minor. GPA: 5.0. Selected graduate coursework: Schur Polynomials and Schubert Polynomials (A+), Combinatorics and Geometry (current), Ramsey Theory (A), Analysis of Boolean Functions (A+), Graph Theory and Additive Combinatorics (A), Probabilistic Methods in Combinatorics (current), Commutative Algebra (A+), Algebraic Topology (A).

Selected preprints

Coalescence Probabilities of Cycle Products *Sep. 2024*

Holden Mui. arXiv:2409.01415.

Flip Graphs on Self-Complementary Ideals of Chain Products *Jan. 2024*

Serena An, Holden Mui. arXiv:2401.01457.

Research experience

Supervised UROP: researcher *Jun. 2022 - Aug. 2022, Jun. 2024 - Aug. 2024*

A research position offered by the MIT math department designed to give MIT undergraduates an opportunity to work on a research project under the guidance of a graduate student mentor. In 2024, I worked with Oriol Solé Pi on computing the probability $1, 2, \ldots, k$ are in the same cycle in a product of two n-cycles. In 2022, I worked with Ashwin Sah, Mehtaab Sawhney, and Tomasz Ślusarczyk on characterizing the upper tail of cycle distributions in sparse Erdős-Rényi random graphs. References: Mehtaab Sawhney and Oriol Solé Pi.

Summer Program for Undergraduate Research: researcher *Jun. 2023 - Aug. 2023*

Worked with Serena An and Elisabeth Bullock on algebraic combinatorics research. We explored properties of flip graphs on self-complementary order ideals in self-complementary posets and presented our work at the MIT SPUR conference. Reference: Elisabeth Bullock.

PRIMES-USA: research student *Jan. 2020 - Jan. 2021*

A free, year-long research program offered by the MIT mathematics department. I worked on a project with Dr. Zarathustra Brady about generating clones. Reference: Zarathustra Brady.

Selected Awards

Putnam Mathematical Competition: rank 21st, 14th, 27th *2021, 2022, 2023*

USA Mathematical Olympiad: honorable mention *2020*

Selected Teaching

MIT Global Teaching Labs: instructor *Jan. 2022, Jan. 2023, Jan. 2024*
An opportunity to support and train the Ghanaian, Tunisian, and Bhutanese IMO teams. In addition to preparing lectures for each country's top students, I visited several schools to stimulate mathematical interest. Reference: Ari Jacobovits and Megha Hegde.

Mathematical Olympiad Program: teaching assistant *Jun. 2022, Jun. 2023, Jun. 2024*
A training program for the USA team at the International Math Olympiad. I graded tests, presented solutions during test review, taught a class, led a singing group, and helped organize social events. Reference: Po-Shen Loh.

Real Analysis: undergraduate assistant *Feb. 2023 - May. 2023*
I held office hours, graded homework and exams, and monitored the class Piazza. Reference: Giada Franz.

Other Experience

USA Mathematical Olympiad Editorial Board: problem writer *Apr. 2022 - present*

Harvard-MIT Mathematics Tournament: problem writer *Oct. 2021 - present*

North Suburban Math League: contest author *Aug. 2021 - present*

Curious Cube: mathematics podcast host (68k views) *Dec. 2021 - Aug. 2023*