Curriculum Vitae

Yifeng Huang

Positions

2022–present **Postdoctoral Fellow**, *University of British Columbia (UBC)*, Mentors: Jim Bryan, Kalle Karu, Zinovy Reichstein

Education

Apr 2022 **Ph.D. in Mathematics**, *University of Michigan, Ann Arbor* (*U of M*), Advisor: Michael Zieve, Co-advisor: Jeffery Lagarias

Thesis: Topics on Polynomial Equations in Noncommutative Rings and Motivic Aspects of Moduli Spaces

2015 **B.Sc. in Mathematics, with First Class Honors**, *Hong Kong University of Science and Technology* (*HKUST*)

Research Interest

I am interested in the interface of algebraic geometry, number theory and combinatorics. I am currently working on matrix Diophantine equations, the Hilbert scheme of points and related moduli spaces, and discrete random matrix theory.

Publications

[7] Yifeng Huang, Ken Ono, and Hasan Saad. "Counting matrix points on certain varieties over finite fields". In: *Contemp. Math., Amer. Math. Soc.* accepted for publication (2023). https://arxiv.org/abs/2302.04830.

[6] Alexander Clifton, Bishal Deb, Yifeng Huang, Sam Spiro, and Semin Yoo. "Continuously Increasing Subsequences of Random Multiset Permutations". In: *European J. Combin.* 110 (2023), p. 103708.

[5] Yifeng Huang. "Mutually annihilating matrices, and a Cohen–Lenstra series for the nodal singularity". In: *J. Algebra* 619 (2023), pp. 26–50.

[4] Yifeng Huang. "Counting on the variety of modules over the quantum plane". In: *Algebr. Comb.* 5.3 (2022), pp. 583–592.

[3] Gilyoung Cheong and Yifeng Huang. "Betti and Hodge numbers of configuration spaces of a punctured elliptic curve from its zeta functions". In: *Trans. Amer. Math. Soc.* 375.9 (2022), pp. 6363–6383.

[2] Gilyoung Cheong and Yifeng Huang. "Cohen–Lenstra distributions via random matrices over complete discrete valuation rings with finite residue fields". In: *Illinois Journal of Mathematics* 65.2 (2021), pp. 385–415.

[1] Yifeng Huang. "Unit equations on quaternions". In: *Q. J. Math.* 71.4 (2020), pp. 1521–1534.

Preprints

[5] Gilyoung Cheong and Yifeng Huang. "The cokernel of a polynomial push-forward of a random integral matrix with concentrated residue". Preprint `https://arxiv.org/abs/2310.09491`. 2023.

[4] Yifeng Huang and Ruofan Jiang. "Punctual Quot schemes and Cohen–Lenstra series of the cusp singularity". Preprint `https://arxiv.org/abs/2305.06411`. 2023.

[3] Yifeng Huang and Ruofan Jiang. "Spiral shifting operators from the enumeration of finite-index submodules of $\mathbb{F}_q[[T]]^d$". Preprint `https://arxiv.org/abs/2210.10215`. 2022.

[2] Tianyu Wang, Yifeng Huang, and Didong Li. "From the Greene–Wu Convolution to Gradient Estimation over Riemannian Manifolds". Preprint `https://arxiv.org/abs/2108.07406`. 2021.

[1] Yifeng Huang. "Cohomology of configuration spaces on punctured varieties". Preprint `https://arxiv.org/abs/2011.07153`. 2020.

Work in Progress

[1] Yifeng Huang and Ruofan Jiang. "Generating series for torsion-free bundles over singular curves: rationality, duality and modularity". In preparation. 2023.

Selected Honors and Awards

2022 AMS-Simons Travel Grant

2019 Math Department Summer Research Grant, funded by Indu and Gopal Prasad Family Fund, awarded to U of M graduate students based on a summer research proposal

Mentoring

2023 *University of Virginia*, Research mentor of REU in Number Theory led by Ken Ono

Invited Talks

2023 *USCD*, Combinatorics Seminar

2023 Southern California Number Theory Day

2023 *USCD*, Algebraic Geometry Seminar

2023 *Simon Fraser University*, Number Theory and Algebraic Geometry Seminar

2023 Joint Mathematics Meeting, Special Session "Quaternions"

2023 Joint Mathematics Meeting, Special Session "Combinatorics and Geometry of Jordan Type and Lefschetz Properties"

2022,2023 *Virginia Tech*, Algebra Seminar

2022 *University of Virginia*, Algebra Seminar

2022 *University of Massachusetts, Amherst*, AMS Eastern Sectional, Special Session "Young Voices in Combinatorics"

2022 *University of California, Irvine*, Number Theory Seminar

2022 *University of Southern California*, Combinatorics Seminar
2022 *Rutgers University*, Graduate Algebra and Representation Theory Seminar
2021 *St Johns University, New York City*, NYC Noncommutative Geometry Seminar
2021 *U of M*, RTG Seminar on Number Theory
2020 *UBC*, Discrete Mathematics Seminar
2020 *UBC*, Algebraic Geometry Seminar
2020 *University of Waterloo*, Algebra Seminar
2020 *Rutgers University*, Algebra Seminar
2020 *University of Minnesota*, Combinatorics and Commutative Algebra Seminar

Teaching

2023 *UBC*, MATH 221 (Matrix Algebra), Lecturer of class of 90
2023 *UBC*, MATH 101 (Integral Calculus), Instructor of 3 interactive classes of 60
2022 *UBC*, MATH 100 (Differential Calculus), Instructor of 4 interactive classes of 60
2020 *U of M*, EECS 203 (Discrete Mathematics for computer science students), Lecturer of a class of 200
2017–2019 *U of M*, MATH 116 (Calculus II), Instructor of an interactive class of 20
2018 *U of M*, MATH 676 (Algebraic Number Theory) taught by M. Zieve, Grader
2016,2021 *U of M*, MATH 115 (Calculus I), Instructor of an interactive class of 20
2015 *U of M*, MATH 105 (Precalculus), Instructor of an interactive class of 20

Services

2023–present Reviewer for MathSciNet
2022–present Reviewer for Forum. Math., AiM and LAA
2022–present *UBC*, Organizer of Algebraic Geometry Seminar

Outreach

2023 *Virginia Tech*, Blacksburg Math Circle, 1-hour lecture on Pólya enumeration theorem to grades 4–8 students

Skills

Languages English (fluent), Chinese Mandarin (native), Cantonese (native), Spanish (reading), French (reading)
Coding C++, Python, Mathematica, Sage