Jay Yang

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Employment

2021-Current McMaster University, Postdoctoral Fellow
2018-2021 University of Minnesota, RTG Postdoctoral Associate

Education

2012-2018 University of Wisconsin - Madison

- Advisor: Daniel Erman
- Ph.D. in Mathematics, August 2018

2009-2012 University of Michigan

- B.S. in Mathematics, 2012

Research Interests

Commutative Algebra, Algebraic Geometry, and Combinatorics

Papers

- Syzygies of $\mathbb{P}^1 \times \mathbb{P}^1$: data and conjectures
  (with Juliette Bruce, Daniel Corey, Daniel Erman, Steve Goldstein, and Robert P. Laudone)
  Journal of Algebra 593C (2022)
  DOI:10.1016/j.jalgebra.2021.10.023
- Homological and combinatorial aspects of virtually Cohen–Macaulay sheaves.
  (with Christine Berkesch, Patricia Klein, and Michael C. Loper) *Trans. London Math. Soc.* **8** (2021)
  DOI:10.1112/tlm3.12036
- Virtual Resolutions of Monomial Ideals on Toric Varieties.
  Proc. AMS, Ser. B **8** (2021)
  DOI:10.1090/bproc/72
- Random Toric Surfaces and a Threshold for Smoothness.
  Journal of Algebra **524** (2019)
  DOI:10.1016/j.jalgebra.2018.12.023
- Random Flag Complexes and Asymptotic Syzygies.
  (with Daniel Erman), *Algebra and Number Theory* **12** (2018) no. 9
  DOI:10.2140/ant.2018.12.2151

- Conjectures and Computations about Veronese Syzygies.
(with Juliette Bruce, Daniel Erman, Steve Goldstein), *Experimental Mathematics* **29** (2018) iss. 4
DOI:10.1080/10586458.2018.1474506

Preprints

- The SchurVeronese package in Macaulay2
(with Juliette Bruce, Daniel Erman, Steve Goldstein) to appear *JSAG* (2021)
arXiv:1905.12661
- Characteristic dependence of syzygies of random monomial ideals
(with Caitlyn Booms and Daniel Erman) to appear *SIAM J. Discrete Math* (2021)
arXiv:2007.13914
- Asymptotic Degrees of Random Monomial Ideals.
(with Lily Silverstein and Dane Wilburne) to appear *Journal of Commutative Algebra* (2021)
arXiv:2009.05174

Software

- Contributor to `RandomIdeals.m2`
- Contributor to `NormalToricVarieties.m2`
- Contributor to `SchurVeronese.m2`
- Contributor to Macaualy2 core

Awards

- Thank a Teacher Note (2020,2021), University of Minnesota
A program allowing students to formally recognize instructors who challenge and inspire them.
- Excellence in Research Award (2017), University of Wisconsin - Madison
Awarded annually by the Mathematics Department for exceptional thesis research.

Conference Talks

2021 AMS Spring Southeastern Sectional - Commutative Algebra and its Interaction with Algebraic Geometry and Combinatorics Special Session
Virtual Resolutions of Monomial Ideals

2020 AMS Fall Central Sectional - Free resolutions, Combinatorics, and Geometry Special Session
Virtual Resolutions of Monomial Ideals on Toric Varieties

2020 AMS Spring Central Sectional - Combinatorial Algebra and Geometry Special Session (Canceled due to COVID)
Virtual Resolutions of Monomial Ideals

2019 AMS Fall Central Sectional - Combinatorial Algebraic Geometry Special Session
Virtual Resolutions of Monomial Ideals

2019 SIAM AG - Random Geometry and Topology Minisymposium
Degree of Random Monomial Ideals

2019 Summer School on Randomness and Learning in Non-Linear Algebra
Degrees of Random Monomial Ideals
2017 CMS Winter Meeting - Toric Geometry Session
Syzygies of Random Monomial Ideals
2017 CA+ (2017)
Random Flag Complexes and Asymptotic Syzygies
2017 SIAM Conference on Applied Algebraic Geometry - Core Algorithms in Algebra and Geometry Minisymposium
Asymptotic Syzygies via Numerical Linear Algebra and High Throughput Computing
2016 HTCondor Week
Computing Betti Tables with HTCondor

Seminar Talks

2020 Texas A&M, Algebra and Combinatorics Seminar
2020 Commutative and Homological Algebra Market Presentations
2020 University of Minnesota, Combinatorics and Commutative Algebra Seminar
2019 University of Minnesota, Commutative Algebra Seminar
2018 University of Minnesota, Commutative Algebra Seminar
2016 University of Wisconsin, Algebraic Geometry Seminar
2016 University of Miami, Combinatorics Seminar
2016 University of Wisconsin, Combinatorics Seminar
2016 University of Illinois - Urbana Champaign, Commutative Algebra Seminar
2015 University of Wisconsin, Graduate Algebraic Geometry Seminar

Teaching

Courses Taught at McMaster University
Fall 2021 Math 1ZA3 *Engineering Mathematics 1*
Courses Taught at University of Minnesota
Spring 2021 Math 1572H *Honors Calculus 2*
Fall 2020 Math 1571H *Honors Calculus 1*
Spring 2020 Math 1272 *Calculus 2*
Fall 2019 UMTYMP *Advanced Topics: Computational Algebraic Geometry*
Spring 2019 Math 5385 *Computational Algebraic Geometry*
Fall 2018 Math 4242 *Applied Linear Algebra*
Courses Taught at University of Wisconsin
Spring 2017 Math 490 *Computational Undergraduate Research Lab* TA
Fall 2016 Math 114 *Algebra & Trigonometry* TA
Fall 2015 Math 114 *Algebra & Trigonometry* TA
Spring 2015 Math 217 *Calculus with Algebra & Trigonometry* TA
Fall 2014 Math 114 *Algebra & Trigonometry* TA
Spring 2014 Math 211 *Business Calculus* TA
Fall 2013 Math 234 *Calculus 3* TA
Spring 2013 Math 222 *Calculus 2* TA
Fall 2012 Math 221 *Calculus 1* TA

Mentoring

Summer 2020 University of Minnesota Research Experience for Undergraduates Mentor
Summer 2019 Senior Thesis Mentor
Summer 2017 Computational Undergraduate Research Lab Mentor
2015-2019 Directed Reading Program Mentor

Organization

2021-Current Organizer of the Algebra and Algebraic Geometry Seminar and McMaster
2019-2021 Organizer of the Commutative Algebra Seimnar at Minnesota
2018 Coorganizer for Macaulay2 Workshop at Wisconsin

Outreach Work

2015 & 2017 Problem Writer for Mega Math Meet
2014 & 2017 Grader for Mega Math Meet