

CURRICULUM VITAE

DANIEL SMOLKIN

AUGUST 10, 2022

CONTACT AND PERSONAL INFORMATION

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EDUCATION

- Ph.D.** in Mathematics. The **University of Utah**, Salt Lake City, UT. GPA: 3.964
Awarded August 1, 2019
- B.S.**, with distinction. The **University of Michigan**, Ann Arbor, MI. GPA: 3.692
Awarded May 1, 2013
Majors: Mathematics (with high honors), Physics. **Minor:** Computer Science

WORK EXPERIENCE

Postdoctoral Assistant Professor at **University of Michigan** in **Ann Arbor, MI** (August 2020–Present)

Postdoctoral Associate at **University of Oklahoma** in **Norman, OK** (August 2019–August 2020)

Data Scientist Intern at **Digital Roots** in **Northville, MI** (June 2013–August 2013)

- Studied natural language processing techniques
- Implemented text classification algorithms in R
- Designed metrics for ranking the success of text classification algorithms specifically tailored for our use cases

Laboratory Assistant at the **University of Michigan Department of Physics** in **Ann Arbor, MI** (December 2010–January 2013)

- Designed and fabricated a system to automatically manipulate optical elements and collect data from optical sensors
- Programmed above system using LabVIEW and the Arduino programming language
- Implemented the Rigorous Coupled Wave Analysis Algorithm (RCWAA) to simulate EM wave diffraction from photonic crystal structures, using Python

PAPERS AND PREPRINTS

1. *Diagonal F -splitting and Symbolic Powers of Ideals*. Submitted. Preprint: arXiv:2208:00051
2. *Asymptotic Behavior of Differential Powers*, with J. Kenkel, L. McPherson, J. Page, M. Stephenson, and F. Yang. Submitted. Preprint: arXiv:2111.15653

3. *The Uniform Symbolic Topology Property for Diagonally F -regular algebras*, with J. Carvajal-Rojas. *J. Algebra*, 15 April 2020. Vol 548, pp25–52. Preprint: arXiv:1807.03928.
4. *A New Subadditivity Formula for Test Ideals*. *J. Pure and Applied Algebra*, March 2020. 224(3), pp1132–1172. Preprint: arXiv:1805.08739
5. *RationalMaps, a package for Macaulay2*, with C. J. Bott, S. Hamid Hassanzadeh, and K. Schwede. To appear in *J. Software for Algebra and Geometry*. Preprint: arXiv:1908.04337, 2019.
6. *The TestIdeals package for Macaulay2*, with A. Boix, D. J. Hernández, Z. Kadyrsizova, M. Katzman, S. Malec, M. Robinson, K. Schwede, P. Teixeira, and E. E. Witt. To appear in *J. Software for Algebra and Geometry*. Preprint: arXiv:1810.02770, 2018.
7. *Diagonal F -regularity of Hibi rings*, with J. Page and K. Tucker. Preprint: arXiv:1810.00149, 2018.
8. *The Maximum Likelihood Degree of Toric Varieties*, with C. Améndola, N. Bliss, I. Burke, C. Gibbons, M. Helmer, S. Hoşten, E. Nash, and J. I. Rodríguez. *J. Symbolic Computation*, May–June 2019. Vol 92, pp222–242. Preprint: arXiv:1703.02251.

TEACHING EXPERIENCE

At the University of Michigan:

- Math 451, Intro to Real Analysis (Winter 2022)
- Math 115, Calculus I (Fall 2021)
- Math 412, Intro to Abstract Algebra (Winter 2021)
- Math 215, Multivariable Calculus (Fall 2020)

At the University of Oklahoma:

- Math 3113, Intro to ODEs (Fall 2019, Spring 2020, Summer 2020).

At the University of Utah:

- Math 1050, College Algebra (Spring 2019). This was an online course
- Math 1220, Calculus II (Summer 2018)
- Math 4400, Introduction to Number Theory (Summer 2017)
- Math 1070, Introduction to Statistical Inference (Fall 2016)
- Math 1310, Engineering Calculus I (Fall 2015)
- Math 1060, Trigonometry (Fall 2014, Spring 2015, Spring 2018)

MENTORING AND ACADEMIC SERVICE

- Referee and review work: have written one review for AMS Math reviews and one review for zbMATH. I have refereed 4 journal articles: 1 for *Communications in Algebra*, 1 for *Journal of Algebra*, 1 for *Journal of Pure and Applied Algebra*, and 1 for *International Mathematics Research Notices*.
- Instructor at Michigan Math Corps, July 2022
- Gave a talk at the University of Michigan Undergrad Math Club, titled “Counting Points in Polytopes.” March 31, 2022.

- Supervised an REU project, “Differential powers and differential closure of ideals,” by Lillian McPherson, Monroe Stephenson, and Fuxiang Yang. I jointly supervised this project with Jennifer Kenkel and Janet Page.
- Mentored a Directed Reading Program student, Julissa Hutchinson Ybarra. We read the first few chapters of Munkres’ Topology. Spring 2020
- Volunteered for High School Math Day event at University of Oklahoma, November 12, 2019.
- Spoke about algebraic geometry at the student algebra seminar at University of Oklahoma (Fall 2019)
- Organized the University of Oklahoma Algebra and Representation Theory Seminar (Fall 2019, Spring 2020)
- Supervised an REU project, “Diagonally F -Regular Toric Rings,” by Dylan Johnson. I jointly supervised the project with Marcus Robinson. We started in Summer 2018 and kept working through the following summer.
- Judged undergraduate mathematics research posters at the Joint Math Meetings in 2018 and 2019.
- Volunteered with the Utah mathematics department’s “Calculus Carnival.” November 8, 2017.
- Presented a poster about mathematics research at University of Utah’s SACNAS event. October 21, 2017.
- Gave a short, interactive math lecture to prospective undergraduates at the University of Utah College of Science’s summer orientation. Summer, 2017.
- Spoke at the “Math Medley” event at the Leonardo Museum in SLC, UT. March 11, 2017.
- Helped organize the mathematics department’s graduate student recruitment weekend. Spring, 2017.
- Co-chair of the Graduate Student Advisory Committee (GSAC) for the mathematics department. 2016–2017
- Organized the graduate student commutative algebra seminar (BIKES). 2015–2017
- Gave numerous lectures for the graduate student colloquium, student commutative algebra seminar, and student algebraic geometry seminar at Utah

INVITED TALKS

- “Conic Modules of Hibi Rings and Chip Firing Games,” AMS Special session on Recent Developments in Commutative Algebra. West Lafayette, IN. April 3, 2020. Cancelled due to COVID-19 pandemic.
- “Symbolic Powers in rings of Positive Characteristic,” École polytechnique fédérale de Lausanne. Luasanne, Switzerland. March 6, 2019.
- “Symbolic Powers in Rings of Positive Characteristic,” University of Wisconsin algebra and algebraic geometry seminar. Madison, WI. January 25, 2019.
- “Diagonal Cartier Algebras and Symbolic Powers,” University of Illinois at Chicago commutative algebra seminar. Chicago, IL. October 22, 2018.
- “Studying Symbolic Powers with Test Ideals,” AMS Special Session on Advances in Commutative Algebra. Ann Arbor, MI. October 20, 2018.
- “Symbolic Powers via Test Ideals,” Route 81 conference. Syracuse, NY. September 29, 2018.
- “Symbolic powers via Test Ideals,” University of Kentucky Algebra Seminar. Lexington, KY. September 20, 2018.

- “Subadditivity and Symbolic Powers,” University of Michigan Commutative algebra seminar. February 8, 2018
- “Subadditivity and Toric Varieties,” AMS Special Session on Commutative Algebra in All Characteristics. San Diego, CA. January 10, 2018
- “Cartier algebras, Subbaditivity, and Symbolic Powers,” University of Utah Commutative Algebra Seminar. December 8, 2017
- “Subadditivity formulas for test ideals,” AMS Special Session on Commutative Algebra. Pullman, WA. April 23, 2017

GRANTS AND AWARDS

- **AMS Graduate Student Travel Grant** January, 2018.
- **RTG student trainee** University of Utah Department of Mathematics, Fall 2013–Summer 2014, Summer 2015, Spring 2017, Fall 2017, Fall 2018.
- **Evelyn O. Bychinsky Award** University of Michigan Department of Mathematics, 2011
- **M.S. Keeler Department of Mathematics Merit Scholarship** University of Michigan Department of Mathematics, 2010