

Zvi Rosen

Curriculum Vitae

Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431

Email: rosenz@fau.edu
Website: zvihrosen.com
Office: 224 Science Building (SE-43)

Education

- Ph.D. Mathematics, University of California, Berkeley. Advisor: Bernd Sturmfels. May 2015
Thesis: Algebraic Matroids in Applications
- M.A. Mathematics, University of Pennsylvania. (Submatriculation joint with B.A.) May 2011
Master's Thesis: Graded Betti Numbers of Graph Curves
- B.A. Mathematics, *summa cum laude*, University of Pennsylvania. Dec 2010
Minor in Near-Eastern Languages and Civilizations.

Employment

- Assistant Professor**, Florida Atlantic University. Aug 2018 –Present
Department of Mathematics.
- Postdoctoral Researcher**, University of California, Berkeley. Sep 2017 –Aug 2018
Department of Statistics. Mentor: Yun S. Song.
- Simons Postdoctoral Fellow**, University of Pennsylvania. Jan 2016 –Aug 2017
Depts of Mathematics & Biology. Mentor: Yun S. Song.
- Visiting Researcher**, The Pennsylvania State University. Jun – Dec 2015
Department of Mathematics. Mentor: Vladimir Itskov.

Teaching

- Assistant Professor**, Florida Atlantic University.
MAD 2104, Discrete Mathematics and Proofs. Spring 2019
MAC 2312, Calculus II. Fall 2018
- Instructor**, University of Pennsylvania. Fall 2016
Math 320, Computer Methods in Mathematics.
- Graduate Student Instructor**, University of California, Berkeley.
Math 10B: Math for Life Sciences Instructor: Per-Olof Persson Spring 2014
Math 1B: Calculus 2 Instructor: Slobodan Simic Spring 2012
Math 1B: Calculus 2 Instructor: Per-Olof Persson Fall 2011

Fellowships & Awards

- MAA Project NExT Fellow, Peach'18 Cohort 2018-2019
- Visiting Graduate Student, Simons Institute for Computing, Berkeley Fall 2014
- Visiting Researcher, Max Planck Institute for Mathematics, Bonn Fall 2013

Graduate Researcher, Research Training Group in Combinatorics, Berkeley
Phi Beta Kappa

2012-2013
2011

Research & Writing

- Refereed Publications*
1. *Algebraic Matroids in Action*. (with Jessica Sidman and Louis Theran). American Mathematical Monthly, to appear, 2019. arXiv:1809.00865.
 2. *Algebraic signatures of convex and non-convex codes*. (with Carina Curto, Elizabeth Gross, Jack Jeffries, Katherine Morrison, Anne Shiu, and Nora Youngs). Journal of Pure and Applied Algebra, 223(9), 3919-3940, 2019. arXiv:1807.02741.
 3. *Geometry of the sample frequency spectrum and the perils of demographic inference*. (with Anand Bhaskar, Sebastien Roch, and Yun S. Song) Genetics 210(2), 665-682, 2018. (Selected as Highlight)
 4. *Algebraic tools for the analysis of state space models*. (with Nicolette Meshkat and Seth Sullivant) The 50th Anniversary of Gröbner Bases, 171-205, 2018. arXiv:1609.07985.
 5. *What makes a neural code convex?* (with Carina Curto, Elizabeth Gross, Jack Jeffries, Katherine Morrison, Mohamed Omar, Anne Shiu, & Nora Youngs) SIAM Journal on Applied Algebra and Geometry, 1(1), 222-238, 2017.
 6. *The geometry of rank-one tensor completion*. (with Thomas Kahle, Kaie Kubjas, and Mario Kummer) SIAM Journal on Applied Algebra and Geometry, 1(1), 200-221, 2017.
 7. *Matrix completion for the independence model*. (with Kaie Kubjas) Journal of Algebraic Statistics, 8(1), 1-21, 2017.
 8. *Algebraic systems biology: a case study for the Wnt pathway*. (with Elizabeth Gross, Heather A. Harrington, & Bernd Sturmfels) Bulletin of Mathematical Biology, 78, 21-51, 2016.
 9. *Parameter-free methods distinguish Wnt pathway models and guide design of experiments*. (with Adam L. MacLean, Helen M. Byrne, & Heather A. Harrington) Proceedings of the National Academy of Sciences, 112(9), 2652-2657, 2015.
- Non-refereed Publications*
1. *Line arrangements modeling curves of high degree: Equations, syzygies, and secants*. (with Gregory Burnham, Jessica Sidman, and Peter Vermeire) Recent Advances in Algebraic Geometry: A Volume in Honor of Rob Lazarsfeld's 60th Birthday, 417, 52, 2015.
- Submitted for Review*
1. *Hyperplane Neural Codes and the Polar Complex*. (with Vladimir Itskov and Alex Kunin). arXiv:1801.02304
 2. *Convex neural codes in dimension 1*. (with Yan X. Zhang). arXiv:1609.07985.
 3. *Algebraic matroids with graph symmetry*. (with Franz Király and Louis Theran). arXiv:1312.3777.
 4. *Computing algebraic matroids*. arXiv:1403.8148.

- Expository Writing*
1. *Graph Curves*. Expository article for Bernd Sturmfels' course in Algebraic Curves. Accessible at: zvihrosen.com/graphcurves.pdf
 2. *Graded Betti numbers of graph curves*. Master's thesis at Penn. Defended 05/2011.

Invited Talks

- Nonlinear Algebra Seminar, University of California, Berkeley Feb 25, 2019
- Combinatorics Seminar, University of Miami Dec 3, 2018
- Algebra Seminar, Florida Atlantic University Nov 6, 2018
- Analysis & Applications Seminar, Florida Atlantic University Oct 11, 2018
- Mathematics Undergraduate Seminar, Florida Atlantic University Oct 8, 2018
- Department Colloquium, Florida Atlantic University Oct 5, 2018
- CBMS: Applications of Polynomial Systems, TCU, Fort Worth, TX (Poster) Jun 4, 2018
- Biology & Medicine Through Mathematics Conference, VCU, Richmond, VA Jun 1, 2018
- Lightning Talks, BSTARS, UC Berkeley Mar 12, 2018
- Song Group Seminar, UC Berkeley Mar 5, 2018
- Mathematics Colloquium, Florida Atlantic University, Boca Raton, FL Feb 22, 2018
- Algebra & Biology Section, Joint Mathematics Meetings, San Diego, CA Jan 12, 2018
- Song Group Seminar, UC Berkeley Oct 18, 2017
- Mathematical Biology Seminar, Penn State University. Sep 14, 2017
- SIAM Conference on Applied Algebraic Geometry, Algebraic Methods in Rigidity Theory Mini-symposium, Georgia Tech. Aug 1, 2017
- Applied Topology Seminar, Brown University. Apr 13, 2017
- Song Group Seminar, University of Pennsylvania. Nov 10, 2016
- Symbolic Computation Seminar, North Carolina State University. Sep 20, 2016
- Song Group Seminar, University of Pennsylvania. May 18, 2016
- Large Geometric Structures & Big Data Seminar, Aalto University, Helsinki. Nov 9, 2015
- MASS Applied Algebraic Geometry Seminar, Penn State University. Oct 14, 2015
- AMS Sectional Meeting, Loyola University, Chicago. Oct 4, 2015
- SIAM Chapter Meeting, UC Berkeley. Apr 20, 2015
- Applied Algebra and Network Theory Seminar, Penn State University. Apr 8, 2015
- Symbolic Computation Seminar, North Carolina State University. Mar 31, 2015
- Statistics Seminar, University of Kentucky. Mar 30, 2015
- Computational Algebraic Geometry Seminar, UC Berkeley. Dec 1, 2014
- Student Combinatorics Seminar, UC Berkeley. Nov 24, 2014
- Lightning Talks, Industry Day, Simons Institute of Computing. Nov 7, 2014
- AMS Fall Sectional Meeting, Combinatorial Commutative Algebra Session, San Francisco State University. Oct 26, 2014
- Prof. J.M. Landsberg's group, Simons Institute of Computing. Oct 23, 2014
- Combinatorics Seminar, San Francisco State University. Oct 22, 2014
- Seminar on Algebraic Combinatorics, Ben-Gurion University, Israel. Dec 23, 2013
- Computational Algebraic Geometry Seminar, Max-Planck Institute for Mathematics, Bonn, Germany. Oct 7, 2013
- Diskrete Geometrie Seminar. Freie Universität Berlin, Germany. Jun 13, 2013
- MEGA 2013. Goethe Universität, Frankfurt, Germany (Poster Presentation) Jun 4, 2013
- Macdonald Polynomials Seminar, UC Berkeley. May 3, 2013
- Valley Geometry Seminar, UMASS Amherst. Apr 5, 2013

- Bernd Sturmfels' Combinatorial Commutative Algebra course, UC Berkeley. Nov 2012
- ECCO'12 Combinatorics Conference, Universidad de Los Andes, Bogotá. Jun 2012
- Bernd Sturmfels' course in Algebraic Curves, UC Berkeley. Dec 2011

Workshops & Conferences

- Joint Mathematics Meetings, Baltimore, MD Jan 2019
- Mathfest, Denver, CO Aug 2018
- Third NYA Population Genomics Workshop, Columbia University, New York, NY Jan 2017
- 2016 Conference on Theory & Biology, Simons Foundation, New York, NY Apr 2016
- SAMSI Neural Network Workshop, Research Triangle Park, NC. Mar 2016
- Second NYA Population Genomics Workshop, Princeton University, Princeton, NJ Jan 2016
- Joint Mathematics Meetings, San Antonio, TX Jan 2015
- IMA Modern Applications of Representation Theory, University of Chicago. July 2014
- AMS Math Research Communities: Algebraic and Geometric Methods in Applied Discrete Mathematics. Snowbird, UT. June 2014
- Algebraic Statistics 2014. Illinois Institute of Technology, Chicago, IL. May 2014
- Summer School in Algebraic Statistics, Nordfjordeid, Norway. June 2013

Service

- ❖ *Mini-symposium Organizing.* Organized, jointly with Nora Youngs, a mini-symposium on “Algebraic Neural Coding” at the SIAM Conference on Applied Algebraic Geometry. July 15-19, 2019
- ❖ *Conference Organizing.* Organized, jointly with Yun S. Song and Khanh Dao Duc, two conferences at the Univ of Pennsylvania:
 - 2nd Annual Penn Symposium on Mathematical & Computational Biology May 22-23, 2017
 - Penn Symposium on Mathematical & Computational Biology May 23-24, 2016
- ❖ *Seminar Organizing.* Organized “Computational Algebraic Geometry” seminar at UC Berkeley jointly with Bernd Sturmfels Fall 2014
- ❖ *Research Mentoring.* Mentored Yutong Wang, an undergraduate at the University of Pennsylvania, in a biostatistics project, jointly with Khanh Dao Duc. Spring 2017
–Present
- ❖ *Peer Review.* Reviewed research articles for: Spring 2016
–Present
 1. IEEE Transactions on Information Theory.
 2. Journal of Combinatorial Theory A.
 3. Advances in Mathematics.
 4. Linear Algebra and its Applications.
 5. AMS Math Reviews.
- ❖ *Grant Writing.* Worked with Heather Harrington and Bernd Sturmfels in writing the grant Royal Society International Exchanges Scheme 2014/R1 IE140219, which allowed me to visit Prof. Harrington at Oxford University in Aug 2014. Spring 2014

- ❖ *Distribution of Notes and Code.* Typed and illustrated notes for various Berkeley classes and ECCO'12 conference. Wrote code for Macaulay2 and Bertini to compute algebraic matroids. Also wrote code in Sage for a matroid application in statistics. All code and notes available on my website.

References

- **Carina Curto** ccurto@psu.edu
The Pennsylvania State University
- **Per-Olof Persson** (Teaching) persson@berkeley.edu
University of California, Berkeley.
- **Yun S. Song** yss@berkeley.edu
University of California, Berkeley.
- **Bernd Sturmfels** bernd@mis.mpg.de, bernd@berkeley.edu
Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany.
University of California, Berkeley.