

JOSH HILLER

Assistant Professor ◊ Department of Mathematics and Computer Science ◊ Adelphi University
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EDUCATION

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| Ph.D. in Mathematics
University of Florida
<i>Thesis: On some variations of the multistage model of carcinogenesis.</i> | <i>2014 - 2017</i> |
| M.S. in Applied Mathematics
Western Carolina University | <i>2012 - 2014</i> |
| Graduate Course Work in Business (18 credit hours)
Webster University in St. Louis | <i>2005 - 2008</i> |
| B.A. in Mathematics, Magna Cum Laude
Webster University in St. Louis | <i>2002 - 2005</i> |

TEACHING EXPERIENCE

Adelphi University: Assistant Professor of Mathematics and Computer Science (Fall 2017-Present)

- **Undergraduate Mathematics/Statistics:** Precalculus; Precalculus for the natural sciences; Calculus I; Calculus II; Bridge to higher mathematics; Statistics and Data Analytics; Senior Seminar I and II; Analysis; Number Theory; Senior Thesis.
- **Graduate Math/Statistics:** Theory of Probability; Foundations of Applied Mathematics; Probability and Statistics; Regression analysis; Advanced regression analysis; Research in statistics (independent study).
- **Computer Science:** Excursions in coding, Introduction to Programming, Software seminar (Functional programming), Programming with Applications in Math, Data Science.

Santa Fe College: Adjunct Assistant Professor (Summer 2016-Summer 2017)

- Intermediate Algebra; Introduction to Logic; Contemporary Mathematics

Western Carolina University: TA/Instructor of record (Fall 2013-Spring 2014)

- Precalculus.

University of Florida: TA (Fall 2014-Spring 2015 and Fall 2016-Spring 2017)

RESEARCH MENTORING

Highlights

- Three published research papers with undergraduate co-authors,
- Three papers in preparation or under review with undergraduate co-authors,
- Mentored undergraduate research students have presented in three separate conferences,
- Attended two workshops on undergraduate research both sponsored by the Council for Undergraduate Research in Mathematics,
- Received two external grants to support undergraduate student research 2019-2020 and 2020-2021,
- Directed or directing three undergraduate and three MS thesis.

Undergraduate

- Undergraduate and honor's thesis supervised—Adelphi University:
 1. Michelle Zhang, Spring 2020, “*Epidemiological controls on graphs.*”
 2. Samantha Vicari, Spring 2021 (expected completion), “*Graphs associated to groups.*”
 3. Eleni Zamagias, Spring 2021 (expected completion), “*Essays in applied probability and statistics.*” (Eleni received an internal fellowship to conduct research over the Summer).
- Other undergraduate research projects:
 4. Ramsey theory for hypergraphs (joint mentoring with Dr. Mark Budden of Western Carolina University), 2015-2017, two students resulting two research publications,
 5. Chaco forest deforestation modeling (joint mentoring with Dr. Mauricio Nunez-Regueiro of the University of Florida), Summer 2017, one student resulting in one research publication,
 6. Binomial matrices, Summer 2019: One student.
 7. Mathematical carcinogenesis (A joint project with Dr. Andrew Penland of Western Carolina University), 2019-2020, 2020-2021: ten students, three papers in progress and four student presentations at professional meetings.
 8. Modeling idea propagation on social networks 2020-2021: four students
 9. Humanistic mathematics, 2020-2021: four students,

Graduate

- MS Thesis:
 10. Joyce Penheiro, “*Two models of the COVID-19 epidemic.*” (expected completion) Fall 2021.
 11. Michelle Zhang, “*International students experience at Adelphi University: a statistical perspective.*” (expected completion) Spring 2021.
 12. Vlada Nakhbo, “*Structural causes of childhood obesity: a meta-analysis.*” (expected completion) Spring 2021.

PUBLICATIONS (* DENOTES UNDERGRADUATE COAUTHOR)

Published or Accepted for Publication

- **Applied Mathematics or Statistics**
 1. “Policy lessons from spatial-temporal enrollment patterns in Argentina’s payment for ecosystems services scheme.” Mauricio Nunez-Regueiro, Lyn Branch, Josh Hiller, Cristina Nunez-Godoy, **Sharmin Siddiqui***, Jose Volante, and Jose Soto, *Land Use Policy*, in press.
 2. “Asymptotic relative risk results from a simplified Armitage and Doll model of carcinogenesis,” Josh Hiller and James Keesling; *Bulletin of Mathematical Biology*, 2018, 80(3), 670-686.
 3. “Characteristic patterns of cancer incidence: Epidemiological data, biological theories, and multistage models,” Josh Hiller, Celeste Vallejo, Leo Betthausen, and James Keesling, *Progress in Biophysics and Molecular Biology*, 2017, Vol. 124, 41-48.
 4. “Cancer incidence and the biology of extreme old age,” Josh Hiller, Celeste Vallejo, Leo Betthausen, and James Keesling; *Integrative Molecular Medicine*, 2016, Vol. 4(1).

- **Algebra or Combinatorics**

5. “A note on Abelian partitionable groups.” Tuval Foguel and Josh Hiller, *Communications in Algebra*, in press.
6. “Constructive methods in Gallay-Ramsey theory for hypergraphs.” Mark Budden, Josh Hiller, and Andrew Penland, *INTEGERS: Electronic Journal of Combinatorial Number Theory*, 2020, Volume 20(A), A4, 14 pages.
7. “On Bruck’s prolongation and contraction maps,” Tuval Foguel and Josh Hiller; *Quasigroups and related systems*, 2019, 53-62.
8. “On the lexicographic product of k -uniform hypergraphs with an application to Ramsey theory,” **Melody Bruce***, Mark Budden, and Josh Hiller; *Australasian Journal of Combinatorics*, 70(3), 2018, 390-401.
9. “The Adjacency-Pell-Hurwitz Numbers,” Josh Hiller, Yesim Akuzum, and Omur Deveci; *INTEGERS: Electronic Journal of Combinatorial Number Theory*, 2018, 18(A83), 16 pages.
10. “The lifting of graphs to 3-uniform hypergraphs and some applications to hypergraph Ramsey theory,” Mark Budden, Josh Hiller, Joshua Lambert, and **Christopher Sanford***; *Involve: a journal of mathematics*, 2017, Vol. 10(1), 65-76.
11. “Hypergraph Ramsey numbers involving paths,” Mark Budden, Josh Hiller, and Aaron Rapp; *Acta Universitatis Apulensis*, 2016, Vol. 48(7) 75-87.
12. “A note on subloop lattices,” Tuval Foguel and Josh Hiller; *Results in Mathematics*, 2016, Vol. 69(1-2), 11-21.
13. “Old friends in unexpected places: Pascal (and other) matrices in $GL_n(C)$,” Josh Hiller; *American Mathematical Monthly*, 2016, Vol. 123(2), 161-167.
14. “Generalized Ramsey theorems for r -uniform hypergraphs,” Mark Budden, Josh Hiller, and Aaron Rapp; *Australasian Journal of Combinatorics*, 2015, Vol. 63(1), 142-152.
15. “A proof of two conjectures of Deveci and Karaduman,” Josh Hiller; *Linear Algebra and its Applications*, 2014, Vol. 446, 163-165.

- **Other Peer Reviewed Publications**

16. “Fibonacci’s Bunny-pocalypse!” (Poem), *The American Mathematical Monthly*, in press.
17. “Misinterpretation vs. Misunderstanding: A Look at ESL Students,” (Education letter), *WLN: A journal of writing center scholarship*, 2004, Vol. 29.4, 10-11.

- **Works in progress**

18. “God whispered to Cantor,” under review.
19. “A Topology Haiku Matrix,” under review.
20. “Minimally Connected Hypergraphs,” With Mark Budden and Andrew Penland, under review.
21. “A very general binomial matrix,” with Leo Betthausen and Omur Deveci, under review.
22. “Avoiding monochromatic sub-paths in uniform hypergraph paths and cycles,” under review.
23. “Groups that have a partition by commuting subsets,” under review.
24. “Counting monochromatic-edge free 2-colorings of hypergraph paths, cycles, and wheels.” Expected completion: July 2020.

25. "An axiomatic and historical review of the Armitage and Doll model of Carcinogenesis." Expected completion July 2020
26. "On the number of up to sign involuntary pascal matrices of dimension n." Expected completion: Dec 2020.
27. "Societal causes of childhood obesity." Expected completion: December 2020.
28. "Modeling deforestation in the face of industrial agriculture." Expected completion: May 2021.

AWARDS AND ACHIEVEMENTS

Grants

1. Council for Undergraduate Research in Mathematics mini-grant award (2020-2021), \$17,900 in support of: "Hypergraph models of carcinogenesis II."
2. Council for Undergraduate Research in Mathematics mini-grant award (2019-2020), \$14,900 in support of: "Hypergraph models of carcinogenesis."
3. Supplemental Research Stipend (2014), Western Carolina University, Graduate School, \$1,000 in support of "Explicit generating sets for Free Groups".
4. Supplemental Research Stipend (2013), Western Carolina University, Graduate School, \$1,000 in support of "Pascal Matrices."

Fellowships or awards

5. Alumni Fellowship (2014-2018), University of Florida, \$25,000/year for four years.
6. Dean's Outstanding Scholar Award (2014), Western Carolina University, Graduate School.
7. Department of Mathematics Outstanding Graduate Student Award (2014), Western Carolina University, Department of Mathematics and Computer Science.

CONFERENCE PRESENTATIONS AND EXTERNAL TALKS

Invited Talks

1. Pohle Colloquium, Adelphi University, Dec. 2019, "*An axiomatic and historical look at Armitage and Doll carcinogenesis.*"
2. Applied Ecology Laboratory Seminar Series (National University of Salta), Sep. 2018, Ciudad Capital Salta, Argentina, "*A simple stochastic model of deforestation in the Gran Chaco forest.*" (*in Spanish*)
3. Amity Lecture Series, June 2018, Garden City NY "*Beyond the promise: The perils of Big Data.*"
4. MAA SE Sectional meeting, Special Session on Discrete Mathematics, March 2018, Clemson SC, "*Random walks and cancer data.*"
5. Hofstra Mathematics Colloquium, March 2018, "*Some simple mathematical models for cancer incidence and relative risk.*"
6. CUNY Graduate Center, Feb. 2018, NYC NY, "*On Burch's prolongation and contraction maps.*"
7. Western Carolina University Mathematics Colloquium, Feb. 2018, Cullowhee NC, "*Multistage models of carcinogenesis.*"

Contributed talks

8. MAA NYC Metro Sectional Meeting, May 2020, Queens College, *“Modeling the propagation of competing ideas in social networks through combinatorial games.”*
9. JMM, Jan. 2020, Denver, *“Combining statistical literacy with real world data-skills: What should a first course in data science for computer science majors cover?”*
10. NYC regional MAA Meeting, May 2018, Hofstra University, *“Integrating Proof Writing and Mathematical Communication Skills Throughout the Mathematics Curriculum (Preliminary Report).”*
11. JMM, Jan. 2018, UC San Diego, *“Modeling market based deforestation prevention policy: the effect of fluctuating commodity prices and industrial agriculture.”*
12. SMURCHOM VII, April 2014, Western Carolina University, *“Felix Klein and his lemma.”*
13. MAA SE Sectional meeting, March 2014, Tennessee Technical University, *“A new twist on the Ping-Pong Lemma...and why we care.”*
14. SERMON 2013, April 2013, High Point University, *“A generalization of Fermat’s Little Theorem to non-singular integer matrices with integer eigenvalues.”*
15. MAA SE Sectional meeting, March 2013, Winthrop University, *“On a relation between Pascal matrices and arbitrary matrices over the complex numbers.”*

MEMBERSHIP

American Mathematical Society, Mathematical Association of American, Society for Conservation Biology, American Association of University Professors (Adelphi University Chapter Secretary, Spring 2019-Spring 2021).