

CURRICULUM VITA

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Employment History:

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| <i>July 2013 – present</i> | University of Northern Iowa, | Associate Professor of Mathematics |
| <i>August 2007-June 2013</i> | University of Northern Iowa, | Assistant Professor of Mathematics |
| <i>July 2006-June 2007</i> | Williams College, | Visiting Assistant Professor of Mathematics |
| <i>August 2003-June 2006</i> | Rice University, | VIGRE Lovett Instructor of Mathematics |

Education:

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| <i>August 2003</i> | Ph.D. in Mathematics, | University of Michigan |
| <i>June 1997</i> | B.S. in Mathematics, | The Ohio State University |

Primary Duties:

- Teaching, with leadership responsibilities in geometry
- Undergraduate Research Committee Chair
- Coordinator and Coach for Student Competitions
- Student Recruitment and Retention Committee
- Math Curriculum Committee Chair
- Research specialty in geometry and topology, scholarship of teaching and learning

Recent Courses: (all at UNI)

Calculus I, Calculus II, Introduction to Statistical Methods, Mathematical Problem Solving, The Real Number System (experimental), Dynamical Systems: Chaos Theory and Fractals, Introduction to Modern Geometries, Advanced Euclidean Geometry, Geometric Transformations, Differential Geometry, Combinatorics, Topics in Geometry, Linear Algebra, Mathematics in Decision Making, Ordinary Differential Equations, Partial Differential Equations, Honors Seminar: Low dimensional topology, knots, surfaces, and space, Knot Theory (experimental course)

Scholarship:

- With Dana Ernst and Angie Hodge, Co-guest-editor of a special issue of PRIMUS on Inquiry Based Learning in first and second year courses. (Issue 7 of volume 27, published in Nov 2017)
- With Dana Ernst and Angie Hodge, Bringing Inquiry to the First Two Years of College Mathematics, *Problems, Resources, and Issues in Mathematics Undergraduate Studies*, 27 (7), 641-645.
- Euclidean Geometry: An Introduction to Mathematical Work, *Journal of Inquiry Based Learning in Mathematics*, no 45 (March 2017)
<http://jiblm.org/downloads/dlitem.php?id=108&category=jiblmjournal>

- *Running a Class Journal*, in *Beyond Lecture: Resources and Pedagogical Techniques for Enhancing the Teaching of Proof-writing Across the Curriculum*, Schwell, Steurer, Vasquez, Eds. MAA Notes Vol 85, 2016. Available at <http://www.maa.org/press/ebooks/beyond-lecture>
- With Douglas Shaw, *Tailoring Modified Moore Method Techniques to Liberal Arts Mathematics Courses*, PRIMUS: Problems, Resources, and Issues in Mathematics Undergraduate Studies, Volume 25, Issue 3, pp 198-211, 2015. (Special Issue on Using Inquiry-Based Learning in Mathematics for Liberal Arts Courses), DOI: 10.1080/10511970.2014.967369
- With James Sellers and Mackenzie Roepke, *Structure and Patterns in m -ary Partition Sequences*, in preparation.
- With Alexander Gorodnik and Ralf Spatzier, *Regularity of Conjugacies of Algebraic Actions of Zariski Dense Groups*, Journal of Modern Dynamics, Volume 2, No. 3, 2008, p509-540.
- With Heather Hardway, Bibhash Mukhopadhyay, Timothy Burke and Robin Forman, *Modeling the precision and robustness of Hunchback border during Drosophila embryonic development*, Journal of Theoretical Biology, Volume 254, No. 2, (2008) 390-399.
- With David Fisher, *Strengthening Kazhdan's Property (T) by Bochner Methods*, Geometriae Dedicata, December 2011, DOI: 10.1007/s10711-011-9686-9
- With David Fisher, *Cocycle Superrigidity and Harmonic Maps with Infinite-dimensional Targets*, International Mathematics Research Notices, 2006, Article ID 72405, 19pp.

Professional Service Activities:

- **Modules Editor** for the Journal of Inquiry Based Learning in Mathematics, April 2017 - present
- **Past-Chair** of the Inquiry Based Learning Special Interest Group of the Mathematical Association of America, January 2017 – January 2018
- **Chair** of the Inquiry Based Learning Special Interest Group of the Mathematical Association of America, January 2016 -- January 2017. This is a group that I founded in conjunction with Stan Yoshinobu and Victor Piercey.
- **Past-Chair** of Iowa Section of the Mathematical Association of America, fall 2011-fall 2012
- **Chair** of Iowa Section of Mathematical Association of America, fall 2010-fall 2011.
- **Vice-Chair** of Iowa Section of Mathematical Association of America (MAA), fall 2009-fall 2010
- **Vice-Chair Elect** of Iowa Section of Mathematical Association of America, spring 2008-fall 2009
- **National Project NExT Fellow**, 2007-2008, MAA professional development and leadership program
- **Iowa-NExT Steering Committee** and Iowa-NExT Fellow, 2007-2014.
- **Mathematical Association of America Committee on Student Activities and Chapters**, Jan 2012-Jan 2018
- **Co-chair**, Program Committee for the Legacy of RL Moore Meeting, Meetings in June 2014 and June 2015

Research Projects with Students

- Knots, Butterfiles, and Branched Covers, with Dan Tarnow, 2017-2018 Academic Year
- An Algorithm for an Upper Bound on the Bridge Index, with Julie Kirkpatrick, Fall 2016 Semester
- 3D Design and Printing for Mathematics, with Bill Wood and Heather Bavido, Summer 2016
- Bridge Numbers for Knots, with Julie Kirkpatrick and Tracey Wulfekehule, Spring 2016 semester

- Menger Curve Shortening Flow for Polygons, with Ben Castle, Jonathan Krein, Jesse Moeller, and Abbie Parker, 2013-2014 Academic Year
- Propellers for Menger Polygon Shortening Transformation, With Jesse Moeller, 2012-2013 Academic Year
- Structure in the m-ary partition function, with Duncan Wright, 2011-2012 Academic Year
- Divisibility for m-nomial coefficients, with Duncan Wright, summer 2011
- Gnomonic Standard Young Tableaux, with Genevieve Becicka, 2010-2011 academic year.
- Student Geometry Research Group: Geometry of a Countable Product of Hyperbolic Planes, with Kyle Pitzen, 2010-2011 academic year
- Exploring m-ary partition sequences, with Mackenzie Roepke, 2008-2009 and 2009-2010 academic years
- Student Geometry Research Group: Large Metric Spaces with Non-positive Curvature, with Kyle Pitzen and Joseph Winder, 2009-2010 academic year
- Isometries of a Giant Product Space, with Corey Gevaert, summer 2009
- Hyperbolic Geometry and Continued Fractions, with Alyssa Soenksen, Honors Thesis 2007-2008 academic year

Graduate Students Supervised

Research papers in support of degree:

- Corey Gevaert, research paper titled *Plotting Limit Sets for Linear Fractional Transformations using Sage*, Spring 2012.
- Mary Gilles, research paper titled *On Gromov's Theorem*, concerning Cayley diagrams and harmonic functions on finitely generated groups. 2010-2011 Academic Year

Thesis Students Supervised:

- Genevieve Johnson, The Programmatic Manipulation of Planar Diagram Codes To Find An Upper Bound on The Bridge Index of Prime Knots, graduation date December 2017
- Mark Ronnenberg, A Survey of Butterflies for Knots and Links, graduation date May 2016
- Kyle Pitzen, Ricci Flow for Piecewise Linear Three-Spheres, graduation date August 2013

Grant Support

- Center for Undergraduate Research in Mathematics, \$6250 to support a group of undergraduates to do research. (Center paid students directly. Total value near \$20000)
- Academy for Inquiry Based Learning (part of the Educational Advancement Foundation) small grant program: \$2500 to support travel for classroom visits with a mentor.
- Pre-Tenure Summer Fellowship: \$4500 from UNI Provost's Office to support research work on harmonic mappings.
- Test Site for NSF/CCLI grant program UTMOST: Undergraduate teaching in Mathematics with Open Software and Textbooks. \$4000 to support efforts to integrate the computer algebra package Sage into linear algebra.

Last updated: 15 April 2018