

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
- Research specialty in differential geometry, Lie theory and dynamical systems

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, Honors Seminar: Low dimensional topology, knots, surfaces, and space

Scholarship:

- 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.
- 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.

Professional Service Activities:

- **Past-Chair** of the Inquiry Based Learning Special Interest Group of the Mathematical Association of America, January 2017 – present
- **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-present
- **Co-chair**, Program Committee for the Legacy of RL Moore Meeting, Meetings in June 2014 and June 2015

Research Projects with Students

- 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, title TBA, expected graduation 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: 6 April 2017