DEPARTMENT OF MATHEMATICS, WASHINGTON STATE UNIVERSITY, PULLMAN, WA 99164 (509)335-8388

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MATTHEW G. HUDELSON, Ph.D.

EDUCATION

1990-1995 *University of Washington* Seattle, WA

Ph.D.

- Mathematics

  Dissertation: "Geometric and Computational Methods for Finding Largest j-Simplices in d-Cubes"
  Advisor: Dr. Victor Klee

1987-1990 *University of Washington* Seattle, WA

B.S.

- Mathematics

AFFILIATIONS

- American Mathematical Society (1990 – present)
- Mathematical Association of America (1990 – present)

PROFESSIONAL EXPERIENCE

Washington State University Pullman, WA

- 1995-2002 Assistant Professor, Mathematics
- 2002-2006 Associate Professor, Mathematics

COURSES TAUGHT

Undergraduate:

- Calculus for Engineers, Calculus for Life Scientists
- Discrete Mathematics, Combinatorics
- Elementary Linear Algebra, Advanced Linear Algebra
- Abstract Algebra
- Graph Theory

Graduate:

- Combinatorics
- Linear Algebra
- Abstract Algebra

GRADUATE STUDENT SUPERVISION

Ph.D. :

Brian Blitz, Ph.D May 2000. Dissertation: *"Walking Groups in Regular Maps"*

Dan Taylor, Ph.D (Degree not completed). Topic: Dynamics of Polygonal Billiards

Elizabeth Balmer, Ph D December 2014. Dissertation: "*Applications of Generalized Laplacian Matrices in Graph Tiling"*

Benjamin Small, Ph D May 2015. Dissertation: "*On a-critical Graphs and their Construction*"

Amy Streifel, Ph D May 2016. Dissertation: " *Enumerating Characteristic Polynomials of Skew-Symmetric Adjacency Matrices for Cactus Graphs*"

Enzo Wendler, Ph D May 2020. Dissertation: "*Alpha Adjacency: A Generalization of Adjacency Matrices*"

Jordan Broussard, Ph D May 2021. Dissertation: "*Entry-wise Recursive Determination of Template Arrays*"

Jessica Dickson, Ph D May 2023. Dissertation: "*Annihilating Operators of Extended Riordan Arrays*"

Rachel Perrier, Ph D May 2023. Dissertation: "*Using Higher Dimensional Extensions of TRIP Maps for Analyzing Periodicity of Multidimensional Continued Fractions*"

Current Ph D students: Jared Brannan, Garrett Kepler, Saxton Wilson, Aleksander Zujev

Service on twenty-five Ph.D committees.

M.S. :

Michelle Buchan, M.S. December 2001.

Alexa Serrato, M.S. December 2015.

Joshua Karas, M.S. May 2017

Jarrick Wick, M.S. May 2019

Fatimah Alzahrani, M.S. 2020

Azzah Albejani, M.S. 2020

Nels Blair, M.S. 202

Service on seventeen M.S. committees.

GRANTS & AWARDS

Battelle Memorial Institute *"Online Learning Environments (OLE) for the Next Century,"* 2/1/99-2/31/00 P.I. Gregory J. Crouch (PI), Matthew G. Hudelson, Gary Brown, TDC, $15,000

NSF DUE -99526819 "*Online Learning Environments: A Collaborative Education Project in Math, Science, and Communications,*"2/28/00-1/31/01 Gregory J. Crouch (PI), Gary Brown, Karen L. Hallgren, Matthew G. Hudelson, Edith A. Jenkins, TDC $74,822
WSU College of Sciences Tom Lutz Memorial Teaching Award, 2002

USAF – F49620-00-1-0001 "*Theoretical Foundations for Data Cycle Maps and Telemetry Tilings,*" 12/01/99 – 11/30/03, Matthew G. Hudelson (PI), William A. Webb, $225,955

NSF DUE - 0127423 "*Adaptive Teaching and Learning Environments in Science and Mathematics Education*,"4/15/02-4/14/03 Gregory J. Crouch (PI), Claudia Brahler, Abbie Brown, Karen L. Hallgren, Matthew G. Hudelson, Edith A. Jenkins, TDC $100,000

Washington State University Provost's Office – "*Developing a Holistic Learning Community Model in Science, Mathematics, Engineering and Technology Education*", 2003, Gregory Crouch, Denny Davis, Matthew Hudelson, Randy Jorgensen, Jenni Light, $25,000

Washington State University Provost's Office – "*Developing a Holistic Learning Community Model in Science, Mathematics, Engineering and Technology Education*", 2004, Gregory Crouch, Denny Davis, Matthew Hudelson, Randy Jorgensen, Jenni Light, $17,000 and $50,000 (Thompson's Fund)

Washington State University Technology Gap Fund – "*Line-Walking Recursive Partitioning for Predicting Inhibition of Drug Metabolism*", 2006-2007, Matthew Hudelson (PI), Jeff Jones, $23,700

NIH – "*Predicting Rates and Regioselectivity in Cytochromoe P450 Mediated Reactions*", 2008-2012, Jeff Jones (PI), Matthew Hudelson, Greg Crouch, $1,868,750 ($1,547,325 funded)

Washington State University Provost's Office – "*Student-Centered STEM Calculus*", 2014, Charles Moore, Sandy Cooper, Matt Hudelson, $75,000

PEER REVIEWED PUBLICATIONS

Hudelson M., V. Klee, D. Larman, Largest *j*-Simplices in *d*-Cubes: The Hadamard Maximum Determinant Problem and Some of its Relatives, *Linear Algebra and its Applications* (1996), **241-243;** 519-598.

Hudelson M., Dissecting d-Cubes into Smaller d-Cubes, *Journal of Combinatorial Theory, Series A* (1998), **81**, 190-200.

Hudelson M., A Solution to the Generalized Cevian Problem Using Forest Polynomials, *Journal of Combinatorial Theory, Series A* (1999), **88**, 297-305.

Gallian J, Higgins A, **Hudelson M.,** Jacobsen J., Lefcourt T., Stevens T.C., Project Next, *Notices of the AMS*, (2000), **47**, 217-220

DeTemple D., **Hudelson M.**, Square-Banded Polygons and Affine Regularity, *The American Mathematical Monthly* (2001), **108**, 100 – 114

Hudelson M., Concurrent Medians of (*2n+1*)-cons, *Forum Geometricorum* (2006), **6**, 139-147

Hudelson M., Formulas Among Diagonals in Regular Polygons and the Catalan Numbers, *Forum Geometricorum* (2006), **6**, 255-262

Hudelson M., Jones J. Line-Walking Method for Predicting Inhibition of P450 Drug Metabolism, *The Journal of Medicinal Chemistry*, (2006), **49(14)**, 4367-4373

Hudelson M., Ketkar N., Holder L., Carlson T., Peng C., Waldher B., Jones J., High confidence Predictions of Drug-Drug Interactions: Predicting Affinities for CYP2C9 with Multiple Computational Methods, *The Journal of Medicinal Chemistry*, (2008), **51(3),** 648-654

Hudelson M., Solution to Problem 11236(c*), *The American Mathematical Monthly*, (2008), **115(2)**, 171-172

Hudelson M., Vertex Topological Indices and Tree Expressions, Generalizations of Continued Fractions, *The Journal of Mathematical Chemistry*, (2010) **47,** 219-228

Hudelson M., Kerzel D., Webb W., The Uniform Seating Problem, *Congressus Numerantium,* (2010) **200**, 203-214

Hudelson M., Proof Without Words: The Alternating Harmonic Series Sums to ln(2), *Mathematics Magazine* (2010) **83**, 294

Clark A., **Hudelson M.**, Mooney B., Determining Polyhedral Arrangements of Atoms Using PageRank, *Journal of Mathematical Chemistry* (2012) **50,** 2342-2350

Hu Y., **Hudelson M.**, Krishnamoorthy B., Tumurbaatar A., Vixie K., Median Shapes, *Journal of Computational Geometry*., (2019) **10(1),** 322-388

Hudelson M., McDonald J., Wendler E., Alpha Adjacency: A Generalization of Adjacency Matrices, *Electronic Journal of Linear Algebra***,** (2019) **35**, 365-375

Hudelson M., Using Graph Tiling to Link Tree Expressions and Edge Deletion Polynomials, *Electronic Journal of Combinatorics*, to appear

Hudelson M., Using Tree Expressions to Enumerate Spanning Trees of Ring Trees, *Electronic Journal of Combinatorics*, to appear

TECHNICAL REPORTS

M. Hudelson, W. Webb, "The $2_n p_k$ Algorithm for Generating Telemetry Frames", *4th Annual ITEA Test Instrumentation Workshop,* 2003 (Report)

M. Hudelson, W. Webb, "A Fast Algorithm for Efficient Telemetry Frame Design", *5thAnnual ITEA Test Instrumentation Workshop,* 2004 (Report)

PUBLICATIONS SUBMITTED OR IN PREPARATION

Hudelson M., Farey Functions, *Mathematics Magazine*, in revision

Hudelson M., Generalizing the Laws of Cosines and Sines via the Divergence Theorem, *Forum Geometricorum,* submitted

Hudelson M., Two Disparate Chemical Applications of the Kirkhoff Matrix Theorem: A Spanning Tree Enumeration Shortcut and Steady State Enzyme Kinetics, *The Journal of Mathematical Chemistry,* submitted

Hudelson M., Nielsen M., Tiling Open Sets with Line Segments, in preparation

Hudelson M., The Sister-Bichord Theorem, in preparation

Hudelson M., Hadamard Weighing Designs, in preparation

Hudelson M., DeFord D., A Reflection Identity on Rectangle Domino Tilings, in preparation

Hudelson M., Sector Expansions in Extended Riordan Arrays, in preparation

SERVICE

Various Department of Mathematics Committees 1996-2025

Project NExT Fellow 1996-1997

WSU Math Club Advisor 1995-1998

Participant, "The Calculus Symposium," McGraw-Hill, August 2008

WSU All-University Math Committee 2005

College of Sciences Equipment Grant Review Committee
2008

Project NExT Consultant 2008-2019

College of Sciences New Faculty Grant Review Panels
2008, 2009

WSU Regents Scholarship Selection Panel 2012, 2013

Participant, "Calculus Review," Pearson, April 2015

College of Arts and Sciences Strategic Planning Committee 2016, 2017

Member of WSU Student Services & Activities Fees Committee Fall 2017-Spring 2019

Project LIFT fellow 2018

Participant, Provost's Leadership Academy 2018

Co-chair of WSU Course Materials Value and Effectiveness Committee Fall 2018-2022

Co-chair of Syllabus Task Force Fall 2018-Fall 2019

WSU Faculty Senate, Senator, Fall 2018-Spring 2020

Faculty member director of Student Book Corporation's board of directors 2019 - 2023

WSU Police Advisory Committee, Fall 2020-Fall 2022

WSU Faculty Affairs Committee member, 2020-Present (*ex officio* from Fall 2023)

WSU Faculty Senate Executive Secretary, Fall 2020-Present

Department of Mathematics Director of Undergraduate Studies, Fall 2023-Present

Department of Mathematics Undergraduate Studies Committee chair, Fall 2023-Present

WSU Syllabus Subcommittee, co-chair Fall 2019– Fall 2021; *ex officio* Fall 2021-Present

WSU Information Technology Strategic Advisory Committee (ITSAC), Fall 2023-Spring 2025

WSU Student Technology Fee Committee, Fall 2023-Present

WSU Parking and Transportation Task Force, Fall 2024-Present

SELECTED PRESENTATIONS

Newton Coefficients of Ehrhart Polynomials, MAA Pacific Northwest Section Meeting, April 10, 2010

Three Hosoya Topological Descriptors Used in Cytochrome P-450 Regioselectivity Prediction, University of Montana Colloquium, November 2, 2009

A Hadamard Matrix Coin-Sifting Algorithm, MAA Math Fest, August 1, 2009

Using Hosoya Topological Descriptors in Cytochrome P-450 Regioselectivity Prediction, Molecular Operating Environment (MOE) User Group Meeting, Montreal, July 2009

Using Hosoya Topological Descriptors in Cytochrome P-450 Regioselectivity Prediction, Pacific NW Conference on Comprehensive Mathematical Modeling in the Natural and Engineering Sciences, June 4, 2009

Evaluating Labeled Tree Expressions Using Determinants of Nearly Skew-Symmetric Matrices, MAA Pacific Northwest Section Meeting, April 4, 2009

Two Vertex Descriptors Based on Hosoya's Matching Descriptor Z(G), University of Idaho Colloquium, November 20, 2008

Adapting Hosoya's Topological Index as a Local Vertex Environment Descriptor, MAA Math Fest, July 31, 2008

A Lower Bound for a Two-Forbidden Distance Chromatic Number of the Plane, MAA Pacific Northwest Section Meeting, April 14 2007

Formulas Relating the Lengths of Diagonals in Regular Polygons and the Catalan Numbers, Digipen University, April 12, 2007

Coloring the Plane with Two Forbidden Distances, University of Idaho Colloquium, September 21, 2006

A Fast Algorithm for Efficient Telemetry Frame Design, *5th Annual ITEA Test Instrumentation Workshop,* 2004

The $2^n p^k$ Algorithm for Generating Telemetry Frames, *4th Annual ITEA Test Instrumentation Workshop,* 2003

PATENT APPLICATIONS

Application of Line Walking Recursive Partitioning to P450 Drug Metabolism
Application of Vertex-Topological Descriptors to P450 Regioselectivity Prediction