

Curriculum Vita

Melissa S. Keranen

Address

28775 Old Colony Road
Calumet, Michigan 49913
Home phone: (906)296-9222
Office phone: (906)487-2908
msjukuri@mtu.edu

University Education

- Ph.D in Mathematics, Michigan Technological University, April 2005.
Advisor: Prof. Donald L. Kreher.
Thesis: “Transverse Steiner Quadruple Systems”
- M.S. in Mathematics, Michigan Technological University, Decemeber 2002.
Advisor: Prof. Donald L. Kreher.
Thesis: “An Infinite Class of Fibres in CURDs”
- B.S. in Mathematics, Michigan Technological University, December 2000.
Summa Cum Laude
Teaching Certificate in Secondary Education

Professional Experience

- **Associate Professor**, Michigan Technological University, 2012-present.
- **Assistant Professor**, Michigan Technological University, 2006-2012.
- **Lecturer**, Michigan Technological University, 2005-2006.
- **Graduate Teaching Instructor with additional administrative duties**, Michigan Technological University, 2003-2005.

Duties Included:

Providing direct support to Director of First-Year Mathematics while she was on leave

Administering the Basic Skills Test to all Calculus I students

Making preparations for the summer math program (MaCH-1)

Couse coordinator for Calculus I

Helped coordinate and direct MTU Mathematics Competition for high school juniors

- **Senior Graduate Teaching Assistant**, Michigan Technological University, 2002-2003.
- **Graduate Teaching Instructor**, Michigan Technological University, 2001-2005.
- **Student Teacher**, Lake Linden-Hubbell High School, September-December, 2000.
Courses Taught:
Algebra I, II
Geometry
8th Grade Computers

Courses Taught

- Introduction to Abstract Algebra
- Combinatorics and Graph Theory
- Design Theory
- Optimization and Graph Algorithms
- Introduction to Cryptography
- Introduction to Combinatorics
- Introduction to Coding Theory
- Linear Algebra
- Calculus I
- Calculus II
- Data, Functions, and Graphs
- Developmental Math

Publications

1. M.S. Keranen, D.L. Kreher and P. Shiue, The quadruple systems of $LF(q)$, $q \equiv 1 \pmod{4}$, *Journal of Combinatorial Designs* **11** (2003) no. 5, 339-351.
2. M.S. Keranen and D.L. Kreher, The 3–designs of $PSL(2, 2^n)$ with block sizes 4 and 5, *Journal of Combinatorial Designs* **12** (2003) 103-111.

3. M.S. Keranen, A.C.H. Ling and R.S. Rees, An infinite class of fibres in CURDs with block sizes two and three, *Journal of Combinatorial Designs*, **12** (2004) 46-71.
4. M.S. Keranen and D.L. Kreher, Transverse Quadruple Systems with 5 holes, *Journal of Combinatorial Designs*, **15** (2006), 315-340.
Correction to “Transverse Quadruple Systems with 5 holes”, *Journal of Combinatorial Designs*, **17** (2009), 492-495.
5. M.S. Keranen, D.L. Kreher, A. Zhuralev, Small Group Divisible Steiner Quadruple Systems, *Electronic Journal of Combinatorics*, **15** (2008), #R40.
6. M.S. Keranen, W. Kocay, D.L. Kreher, B. Li, Degree Sequence Conditions for Partial Steiner Triple Systems, *Bulletin of the Institute of Combinatorics and its Applications*, **57** (2009), 71-74.
7. J. Asplund, M.S. Keranen, Proper Edge Coloring of $BIBD(v, 4, \lambda)$ s, *Australasian Journal of Combinatorics*, **47** (2010), 59-76.
8. J. Asplund and M.S. Keranen, Mutually Orthogonal Equitable Latin Rectangles, *Discrete Math*, **311** (2011), 1015-1033.
9. J. Tao, J. Ma, M. Keranen, J. Mayo, CK Shene, DESvisual: A Visualization Tool for the DES Cipher, *Journal of Computing Sciences in College*, **Vol. 27, Number 1** (2011), 81-89.
10. J. Asplund and M.S. Keranen, A Note on Proper Edge Coloring of $BIBDs$ *Bulletin of the Institute of Combinatorics and its Applications*, **63** (2011), 109-110.
11. M.S. Keranen, M.R. Laffin, Fixed block configuration group divisible designs with block size six, *Discrete Math*, **312** (2012), 745-756.
12. J. Tao, J. Ma, M. Keranen, J. Mayo, CK Shene, ECvisual: A Visualization Tool for Elliptic Curve Based Ciphers, *Proceedings of the 43rd ACM Technical Symposium on Computer Science Education*, (2012), 571-576.
13. M.S. Keranen, D.L. Kreher, S. Ozkan, Uniform two-class regular partial Steiner triple systems, *Journal of Combinatorial Designs*, **20** (2012), 161-178.
14. M.S. Keranen, S. Ozkan, The Hamilton-Waterloo problem with 4-cycles and a single factor of n -cycles, *Graphs and Combinatorics*, **29** (2013), 1827-1837.
15. J. Asplund, M.S. Keranen, C. Rodger, Enclosings of λ -Fold 5-Cycle Systems: Adding One Vertex, *Journal of Combinatorial Designs*, **22** (2014), 196-215.
16. C.J. Colbourn, M.S. Keranen, D.L. Kreher, F-Vectors of Pure Complexes of Rank Three, *Discrete Math*, **320** (2014), 26-39.
17. J. Tao, J. Ma, M. Keranen, J. Mayo, CK Shene, C. Wang, RSAvisual: A Visualization Tool for the RSA Cipher, *Proceedings of the 44th ACM Technical Symposium on Computer Science Education*, (2014), 635-640.

18. J. Asplund, M.S. Keranen, C.A. Rodger, Enclosings of λ -fold 5-cycle systems for $u = 2$, *Discrete Math*, **338** (2015), 743-765.
19. M.S. Keranen, Some results on transverse Steiner quadruple systems of type $g^t u^1$, *Ars Combinatoria*, **120** (2015), 85-95.
20. C. Li, J. Ma, J. Tao, M.S. Keranen, J. Mayo, CK Shene, C. Wang, VIGvisual: A Visualization Tool for the Vigenere Cipher, *Proceedings of the 20th annual Conference on Innovation and Technology in Computer Science Education*, (2015), 129-134.
21. J. Ma, J. Tao, M.S. Keranen, J. Mayo, CK Shene, C. Wang, SHAvisual: A Visualization Tool for Secure Hash Algorithm, *122nd ASEE Annual Conference and Exposition*, (2015), 26.1371.1-26.1371.18, <https://peer.asee.org/24708>.
22. J. Asplund, D. Kamin, M.S. Keranen, S. Ozkan, A. Pastine, On the Hamilton-Waterloo problem with triangle factors and C_{3x} -factors, *Australasian Journal of Combinatorics*, Volume **64** (3) (2016), 458-474.
23. J. Ma, J. Tao, M.S. Keranen, J. Mayo, CK Shene, C. Wang, AESvisual: A Visualization Tool for the AES Cipher, *Proceedings of the 21st Annual Conference on Innovation and Technology in Computer Science Education*, (2016), 230-235.
24. C.J. Colbourn, M.S. Keranen, and D.L. Kreher, The 3-GDDs of type $g^3 u^2$, *J. Algebra Comb. Discrete Appl* **3(3)** (2016), 135–144.
25. M.S. Keranen, A. Pastine, A Generalization of the Hamilton-Waterloo Problem on Complete Equipartite Graphs, *Journal of Combinatorial Designs*, **25** (2017), 429-476.
26. B. Freyberg, M.S. Keranen, Orientable \mathbb{Z}_n -distance magic labeling of Cartesian product of two cycles, *Australasian Journal of Combinatorics*, **69(2)** (2017) 222-235.
27. B. Freyberg, M.S. Keranen, Orientable \mathbb{Z}_n -distance magic labeling of Cartesian products of many cycles, *Electronic Journal of Graph Theory and Applications*, **5(2)** (2017) 304-311.
28. J. Hodaj, M.S. Keranen, D.L. Kreher, L. Tollefson, Some new Kirkman signal sets, *Designs, Codes, and Cryptography*, (2017) <https://doi.org/10.1007/s10623-017-0445-2>.
29. B. Freyberg, M.S. Keranen, Orientable \mathbb{Z}_n -distance magic graphs via products, *Australasian Journal of Combinatorics*, **30(3)** (2018) 319-328.
30. M.S. Keranen, J. Lauri, Computing Minimum Strong Rainbow Colorings of Block Graphs, *Discrete Mathematics & Theoretical Computer Science*, **20(1)** (2018) #22.
31. B. Freyberg, M.S. Keranen, d-Handicap tournaments, *Discrete Math*, Submitted.
32. M.S. Keranen, D.L. Kreher, M. Salvatore, A. Tripodi, Uniformly resolvable decompositions of K_v in 1-factors and 4-stars, *Journal of Combinatorial Designs*, Submitted.
33. M.S. Keranen, A. Pastine, On the Hamilton-Waterloo problem: the case of two cycles of sizes of different parity, *Ars Mathematica Contemporanea*, Submitted.

34. J. Asplund, M.S. Keranen, Hamiltonicity of 2-block intersection graphs of $TS(v, \lambda)$: $v \equiv 0$ or $4 \pmod{12}$, *Journal of Combinatorial Designs*, Submitted.

Grants

- “Conference on Graph Decompositions at Michigan Technological University”, NSF (Principle Investigator), \$11, 999.
- “The Design of Course Materials and Visualization System for Modern Cryptography”, NSF (Co-Investigator).
- IMA Participating Institutions Conference Proposal: Combinatorial Configurations and their Applications, (Co-Investigator).

Awards and Honors

- 2017-2018 Kliakhandler Fellow
Michigan Technological University
- Outstanding Faculty Teaching Award (Senior Level),
Michigan Technological University, 2015.
- Outstanding Faculty Research Award (Junior Level),
Michigan Technological University, 2011.
- Outstanding Faculty Teaching Award (Junior Level),
Michigan Technological University, 2008.
- Graduate Student Outstanding Service Award,
Michigan Technological University, 2005.
- Class of 1950 Dissertation Fellowship,
Michigan Technological University, 2004.
- Graduate Student Outstanding Research Award,
Michigan Technological University, 2004.
- 2002 “Woman of Promise”, Michigan Technological University, 2002.
- Graduate Student Outstanding Teaching Award,
Michigan Technological University, 2002.
- Graduate Student Outstanding Teaching Award,
Michigan Technological University, 2001.
- Departmental Scholar Award from Department of Mathematical Sciences,
Michigan Technological University, 2000.
- Norman E. Scholz Memorial Award for Excellence
(Outstanding Mathematical Senior),
Michigan Technological University, 2000.
- Michigan Technological University Dean’s List, 1997-2000.

- Member of Omicron Delta Kappa Honor Society.
- Member of Phi Kappa Phi Honor Society.

Professional Affiliations

- The Institute of Combinatorics and its Applications (ICA)
- ICA Council, elected member, 2018-2021
- Mathematical Association of America

Service

- Conference Organizer, *4th Kliakhandler Conference - Graph Decompositions*, Michigan Tech, August 2018.
- Doctoral Advisory Committee Member, Samuel Judge, April 2018.
- Graduate Committee, 2017-2018
- Maternity Leave Review Committee, 2016
- Graduate Teaching Assistant Mentor, 2016-2017 Melinda Kleczynski
- Master's Advisory Committee Member, Amanda Stenzelbarton, December 2016.
- Graduate Teaching Assistant Mentor, 2015-2016 Mustafa Aggul
- MA1161 Course Coordinator, August 2014-May 2016
- Doctoral Advisory Committee Member, Alex Klinkhamer, April 2016.
- Master's Advisory Committee Member, David Fear, Monash University, April 2014.
- Master's Advisory Committee Member, Ellen Kamischke, MTU, December 2013.
- Doctoral Advisory Committee Member, Erik Westlund, MTU, May 2010.
- Master's Advisory Committee Member, Kira Durand, MTU, August 2009.
- Master's Advisory Committee Member, Rachel Robertson, MTU, December 2008.
- Master's Advisory Committee Member, Alex Schaefer, MTU, April 2008.
- Master's Advisory Committee Member, Erik Westlund, MTU, June 2006.
- Undergraduate Committee, 2010-2011, 2011-2012, 2012-2013, 2013-2014, 2014

- Hiring committee for Director of First Year Math and Developmental Math Specialist, 2007.
- Graduate Teaching Assistant Mentor, 2011-2012, Ryan Bruner
- Graduate Teaching Assistant Mentor, 2014-2015 Xueling Li
- Conference Co-organizer, *Combinatorial Configurations and their Applications*, Michigan Tech, August 2009.
- Refereed papers for: Journal of Combinatorial Designs, Journal of Combinatorial Theory, Series A, SIAM Journal on Discrete Math, Discrete Math, Designs Codes and Cryptography, Ars Combinatoria, Electronic Journal of Combinatorics, Graphs and Combinatorics, JACODESMATH, Australasian Journal of Combinatorics, Bulletin of the ICA, Ars Mathematica Contemporanea
- Reviewed books for: Prentice Hall and CRC Press.
- Wrote and graded departmental exams
 - Winter 2007-Combinatorics Proficiency
 - Fall 2007-Combinatorics Proficiency
 - Winter 2008-Combinatorics Proficiency
 - Fall 2008-Design Theory Comprehensive
 - Winter 2010-Combinatorics Qualifier
 - Winter 2011-Design Theory Comprehensive
 - Fall 2011-Combinatorics Qualifier
 - Winter 2012-Combinatorics Qualifier
 - Fall 2017 - Combinatorics Qualifier
 - Winter 2018 - Combinatorics Qualifier

Current Graduate Students

Past Graduate Students

1. Bryan Freyberg (Co-Advisor), PhD, 2017.
2. Adrian Pastine (Co-Advisor), PhD, 2016.
3. Leah Tollefson, M.S., 2015.
4. Jezerca Hodaj, M.S., 2014
5. Michael Misson, M.S., 2011.

6. David Kamin, M.S., 2011.
7. Melanie Laffin, M.S., 2011.
8. Joshua Ruark, M.S. Coursework Option, 2011.
9. John Asplund, M.S., 2010.
10. Artem Zhuravlev (Co-Advisor), M.S., 2007.

Undergraduate Students

1. Juho Lauri, “Computing Minimum Strong Rainbow Colorings of Chordal Graphs”, 2014.
2. Gaurav Jain, “Bryant-Scharaschkin & Oberwolfach Problem”, 2014.
3. John Asplund, Senior Project “Mutually Orthogonal Equitable Latin Rectangles”, 2008.
4. Current advisor for the undergraduate discrete math students.

Conferences

1. 31st Midwest Conference on Combinatorics and Combinatorial Computing, Carrollton, Georgia, October 2017. (Presented)
2. 26th Coast Combinatorics Conference, Kailua-Kona, HI, February 2017. (Presented)
3. Auburn Conference on Designs, Graphs, and Codes, Auburn, AL, January 2016. (Invited Speaker)
4. Conference on Combinatorial Designs and Graph Theory in honor of Mohan Shrikhande on the occasion of his retirement, Mount Pleasant, MI, October 2015. (Invited Speaker) *The Hamilton-Waterloo Problem with triangle factors and C_{3x} -factors*
5. Algebraic Combinatorics and Applications, The first annual Kliakhandler Conference, Houghton, MI, August 2015. (Presented)
6. SIGCSE 2015: 46th ACM Technical Symposium on Computer Science Education, Kansas City, MO, March 2015. (Workshop-Presented)
7. 45th Southeastern International Conference on Combinatorics, Graph Theory and Computing, Boca Raton, Florida, March 2014. (Presented)
8. Twenty-Fifth Midwest Conference on Combinatorics, Cryptography, and Computing, Las Vegas, NV, October 2011. (Presented)

9. Consortium for Computing Sciences in Colleges, Huntington, Indiana, September 2011. (Presented)
10. 3rd Canadian Discrete and Algorithmic Mathematics Conference, Victoria, Canada, May 2011. (Presented)
11. 42nd Southeastern International Conference on Combinatorics, Graph Theory and Computing, Boca Raton, Florida, March 2011. (Presented)
12. 33rd Australasian Conference on Combinatorial Mathematics and Combinatorial Computing, Newcastle, Australia, December 2009. (Presented)
13. Combinatorial Configurations and their Applications, MTU, August 2009. (Presented)
14. 39th Southeastern International Conference on Combinatorics, Graph Theory and Computing, Boca Raton, Florida, March 2008. (Presented)
15. 1st Canadian Discrete and Algorithmic Mathematics Conference, Alberta, Canada, May 2007. (Presented)
16. Michigan Technological University Research Symposium, January 2007. (Presented)
17. 18th Midwestern Conference on Graph Theory, Cryptography and Computing, Las Vegas, Nevada, November 2003.
18. 33rd Southeastern International Conference on Combinatorics, Graph Theory and Computing, Boca Raton, Florida, February 2002.(Presented)
19. Design Theory 2001, Resolvability and Parallelisms, Vancouver, B.C., Canada, May 2001.

July 10, 2018