Curriculum Vitae
Garth Isaak
Fall 2004

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Education:

- Ph.D. Interdisciplinary, from Rutgers Center for Operations Research (RUTCOR), Rutgers University, October 1990.
- B.A. summa cum laude, Bethel College, Kansas 1984, majors in Mathematical Sciences, Chemistry and Physics.

Academic Positions:

- Associate Professor (with tenure), Department of Mathematics, Lehigh University 1998 -.
- Assistant Professor, Department of Mathematics, Lehigh University 1993 - 1998.
- Visiting Assistant Professor, Department of Mathematics, Lehigh University 1992 - 1993.
- John Wesley Young Research Instructor, Department of Mathematics and Computer Science, Dartmouth College, 1990 - 1992.
- Teaching Assistant, Departments of Mathematics and Computer Science, Rutgers University, 1985 - 1990.
- Mathematics Instructor, Bethel College, Kansas 1984 - 1985.
- Science Instructor, Hesston Junior College, 1984 - 1985.

Publications:

Articles in refereed journals
1. H. Abeledo and G. Isaak, A Characterization of Graphs that Ensure the Existence of Stable Matchings, Math. Social Sciences, **22** (1991) 93–96.
2. G. Isaak, S. Kim, T.A. McKee, F.R. McMorris and F.S. Roberts, 2-Competition Graphs, SIAM J. Discrete Math., **5** (1992) 524–538.
3. G. Isaak, Bounded Discrete Representations of Interval Orders, Discrete Appl. Math., **44** (1993) 157–183.
4. G. Hurlbert and G. Isaak, On the de Bruijn Torus Problem, J. Combinatorial Theory A, **64** (1993) 50–62.
5. G. Isaak, Scheduling Rooted Forests with Communication Delays, Order, **11** (1994) 309–316.
6. J.P. Barthelemy, O. Hudry, G. Isaak, F.S. Roberts and B. Tesman, The Reversing Number of a Digraph, Discrete Appl. Math., **60** (1995) 39–76.
7. K.P. Bogart, P.C. Fishburn, G. Isaak and L. Langley, Proper and Unit Tolerance Graphs, Discrete Appl. Math., **60** (1995) 99–117.
8. G. Hurlbert and G. Isaak, New Constructions for de Bruijn Tori, Designs, Codes and Cryptography, **6** (1995) 47–56.
9. G. Isaak, Tournaments as Feedback Arc Sets, Electronic Journal of Combinatorics, **2** (1995) #R20, 19pp.

10. J. Driscoll, D. Healy and G. Isaak, Scheduling Dyadic Intervals, Discrete Appl. Math., **63** (1995) 101–116.

11. G. Hurlbert and G. Isaak, Equivalence Class Universal Cycles for Permutations, Discrete Math., **149** (1996) 123–129.

12. G. Hurlbert and G. Isaak, On Higher Dimensional Perfect Factors, Ars Combinatoria, **45** (1997) 129–139.

13. K.P. Bogart and G. Isaak, Proper and Unit Bitolerance Orders, Discrete Math., **181** (1998) 37–51.

14. G. Isaak, Powers of Hamilton Paths in Interval Graphs, J. Graph Theory **27** (1998) 31–38.

15. S. Donelley and G. Isaak, Hamiltonian Powers in Threshold and Arborescent Comparability Graphs, Discrete Math., **202** (1999) 33–44.

16. A.B. Evans, G. Isaak and D. Narayan, Representations of Graphs Modulo n, Discrete Math., **223** (2000) 109 – 123.

17. K.P. Bogart, G. Isaak, J. Liason and A. Trenk, Comparability Invariance Results for Tolerance Orders, Order, **18** (2001) 281–294.

18. G. Isaak, Constructions for Higher Dimensional Perfect Factors, Aequationes Math., **64** (2002) 70–88.

19. G. Isaak, Sum List Coloring 2 by n Arrays, Electron. J. Combinatorics **9** (2002) Note 8, 7 pp.

20. G. Isaak, K. Nyman and A. Trenk, A Heirarchy of Classes of Bounded Bitolerance Orders, Ars Combinatoria, **69** (2003) 33 – 53.

21. G. Isaak and D. Narayan, A Complete Classification of Tournaments having a Disjoint Union of Directed Paths as a Minimum Feedback Arc Set, J. Graph Theory, **45** (2004) 28 - 47.

22. G. Isaak and D. Narayan, A Classification of Tournaments having an Acyclic Tournament as a Minimum Feedback Arc Set, Inf. Proc. Let. **92** (2004) 107 - 111.

23. G. Isaak, Sum List Coloring Block Graphs, to appear in Graphs and Combinatorics.

Articles in refereed conference proceedings

24. G. Isaak and B. Tesman, The Weighted Reversing Number of a Digraph, Congressus Numerantium, **83** (1991) 115–124.

25. G. Hurlbert and G. Isaak, A Meshing Technique for de Bruijn Tori, Contemporary Math. **178** (1994) 153–160.

Articles submitted to refereed journals

26. G. Isaak, Hamiltonicity of Digraphs for Universal Cycles of Permutations, submitted.

27. M.J. Fisher and G. Isaak, Edge Colored Complete Bipartite Graphs with Trivial Automorphism Groups, submitted.

Honors and awards

- Fellow of the institute for combinatorics and its applications (since 1997)
- Class of 1961 associate professor, Lehigh University 2001-2003

Research funding

- Office of Naval Research 1994-1997, Interval Orders with Bounds and Tolerances (competitive grant)
- Reidler Foundation summer funding 1993, 1997, 1998, 2000-2004 (not competitive)

Professional presentations

Invited research presentations at conferences, departmental colloquia and seminars
- Midwest Conference on Combinatorics, Cryptography, and Computing, October 2004
- Rutgers Center for Operations Research Colloquium, September 2004
- Arizona State University Colloquium, May 2004
- Combinatorialists of New England conference, December 2000
- University of Pennsylvania Combinatorics seminar, February 2000
- Drexel University Mathematics Colloquium, November 1999
- University of Delaware Combinatorics Seminar, April 1999
- Dartmouth College combinatorics seminar, December 1995
- Combinatorics Seminar, Arizona State University, November 1991

Lehigh Colloquia and Seminars
- Mathematics Department Colloquia, September 1996, October 1997, September 1998, October 2002, October 2004
- Lehigh Optimization seminar, September 2002 and October 2004
- Industrial Engineering Seminar, November 1996 and October 1993

Invited research presentations at conference special sessions
- Southeastern Combinatorics conference special session on tolerance graphs and orders, March 2004
- SIAM (Society for Industrial and Applied Mathematics) special session on orders, San Diego, August 2002
- AMS (American Mathematical Society) special session on graph theory, San Diego, January 2002
- DIMACS (Center for Discrete Mathematics and Computer Science) workshop on tolerance graphs, July 2001
- ORSA/INFORMS (Operations Research Society of America/ Institute for Operations Research and the Management Sciences) national conference special sessions; New York, October 1990, Anaheim, November 1991, Atlanta November 1996
- AMS (American Mathematical Society) summer meeting, special session on algorithms for graphs and matroids, Burlington, August 1995
- Advanced Research Institute for Discrete Applied Mathematics, Rutgers University June 1991 and June 1992

Invited Research Talks for Undergraduates
- Gettysburg College, October 1999
- Moravian College, October 1999 and November 2000
- Messiah College, October 2002, October 1998 and December 1990
- DREI (Rutgers University, Discrete Research and Educational Institute) talk for high school teachers, July 1998
- Lafayette College, (NSF research experiences program), July 1993
- Bethel College, series of 3 lectures for undergraduates and one public lecture, January 1993
- Dickinson College, October 1990

Other Research Talks
- Horizons in combinatorics conference, Vanderbilt University, May 2001
- Southeastern Conferences on Combinatorics, graph theory and computing, Boca Raton and Baton Rouge, Februaries/Marches 2003, 2002, 1999, 1996, 1994, 1991, 1990, 1989
- SIAM (Society for Industrial and Applied Mathematics) Discrete Mathematics Conferences, Nashville June 2004, Minneapolis June 2000, Toronto July 1998, Baltimore June 1996, Alberquerque June 1994, Vancouver June 1992
- Quadrenniel International Conferences on Graph Theory, Combinatorial Applications and Algorithms, Kalamazoo June 1996 and June 2000
- ORDAL (Orders and Algorithms) Lyon France July 1994

Teaching and Advising

Regular Courses taught 2000 - 2004 with approximate enrollment and instructor evaluation out of 5 if available
- Fall 2004, MATH 446 (Combinatorics); 13 students
- Spring 2004, Math 76 (Calculus I, part B), 2 sections 120 students total, 3.4/5.0.
- Fall 2003, MATH 75 (Calculus I, Part A), 2 sections, 140 students total, 3.27/5.0.
- Spring 2003, MATH 251 (Combinatorics), 6 students, 4.0/5.0; MATH 448 (Combinatorics and Graph Theory), 6 students, 4.0/5.0.
- Fall 2002, MATH 51 (Survey of Calculus I), 100 students, 3.13/5.0; MATH 446 (Combinatorics), 6 students, 4.5/5.0.
- Spring 2002, MATH 12 (Basic Statistics), 40 students, 4.19/5.0; MATH 243 (Algebra), 11 students, 4.09/5.0.
- Fall 2001, MATH 242 (Linear Algebra), 16 students, 3.87/5.0; MATH 407 (Theory and Technique of Optimization), 7 students, 4.57/5.0.
- Spring 2001, MATH 12 (Basic Statistics), 34 students, 3.68/5.0; MATH 448/251 combined course (Combinatorics and graph theory/Combinatorics), 10 students, 4.56/5.0.
- Fall 2000, MATH 9 (Finite Mathematics), 25 students, 4.15/5.0; MATH 242 (Linear Algebra), 17 students, 3.69/5.0.
- Spring 2000, MATH 243 (Algebra), 15 students, 4.5/5.0; MATH 446 (Combinatorics), 6 students, 4.5/5.0.

Special topics courses and reading courses 2000-2004
- Spring 2004, reading course, graduate combinatorics topics, 2 students.
- Fall 2003, graduate graph theory seminar, 3 students.
- Spring 2003, reading course, graduate graph theory topics, 1 student.
- Spring 2002, reading course, graduate matroid theory, 1 student.
- Fall 2001, reading course, graduate graph theory topics, 1 student.
- Spring 2001, MATH 410, graduate seminar on theory of voting, 3 students.
- Fall 2000, undergraduate reading course in linear algebra, 1 student; MATH 201, undergraduate problem solving, 5 students;

Course development

I have introduced the following courses: MATH 201 (1 credit), undergraduate problem solving; MATH 251 (3 credits), undergraduate combinatorics; MATH 446 (3 credits) graduate combinatorics; MATH 448 (3 credits), graduate combinatorics and graph theory.

Non-research advising

- Mathematics club co-advisor (periodically) 1993 - 2002
- Putnam (annual nationwide mathematics contest) and Mathematical Modeling Contest advisor 1997 - 2001
- 1998-2002 Mathematics majors co-advisor (approximately 30 students)
- Fist year student advisor to approximately 20 students, starting fall 1997 (through 1999)

Graduate research advising - Ph.D. committee member

- Electrical Engineering (Hyung Lee 1994, Cindy Wang 1994 - 1996, Kai Ting Shen 1995, Prakash Math 2001 -)
- Computer Science (Ozmun Guizide 1998 - 1999, Pauline Chu 1999 - 2003, Li Yu 2003 - 2004, Shenzhi Li 2003 -)
- Industrial Engineering (Kedar Naphende 1995 - 1997, Peiling Wu 1999 - 2001 , Nianpen Chen 2000 - 2003 , Jinlong Ban 2002-2004, Shangyuan Luo 2003 - 2004, Joao Goncalves 2003 -, Ozer Ackus 2004 -)
- Mathematics (John Frohmeyer 2000 - 2002)

Research advising

- Sam Donelly, 1996-1997, undergraduate thesis, entered graduate program in artificial intelligence, University of Georgia.
- Darren Narayan, 1998- 2000, Ph.D. May 2000, tenure track job at Rochester Institute of Technology.
- Trisha Moller, 2000 - 2004, Ph.D. January 2005 (thesis defended May 2004), tenure track job at DeSales University.
- Brian Heinold, 2003 - , Ph.D. work in progress.
- Matt LaPadulla, 2004 -, Ph.D. work in progress.
- Jen Scancella, 2004 -, Ph.D. work in progress.

University Service

Service to University
- ECE (electrical and computer engineering) search committee for 2 positions, 2001 - 2002
- Member, University Committee on Discipline, 2002 -
Service to College
- Task force on the freshman year experience, spring 1998
- Committee on Computer Science BA, spring 1999
- Committee on teaching evaluations, spring 2000
- Dean's scholarship committee Spring 2002

Service to Department
- Planning Committee, 1998 - 1999
- Hiring plan committee 1999
- Mathematics chair search committee 2000 - 2001
- Mathematics postdoctoral position search committee 2001 - 2002
- Chair's advisory committee, 2001-2003, 2004-
- Graduate Coordinator, 2002 -
- Attend NSF funding opportunities conference, Washington DC, May 2003, May 2004

Faculty Development
- Attended Lily conference on teaching, Miami University, Ohio October 1993 and present conference information at faculty development lunch
- Organized discussion (with R. Barnes) on critical thinking faculty development lunch March 1994
- Co-organizer regional Project Kaleidoscope conference, Lehigh University Feb 1997
- Attended Project Kaleidoscope conferences on teaching, Kansas City September 1998, College Park October 1999
- Attend AAHE (American Association on Higher Education), conference on the future of faculty roles and rewards, Feb 2001, present at faculty development lunch, Feb 2001

External Professional Activities/Service
- External examiner Swarthmore college honors program May 1994 and May 1996
- Assist in running graph theory workshop for high school teachers at DIMACS center, Rutgers University, July 1998
- July 2001, Organizer, research workshop on tournaments at DIMACS center Rutgers University, run in parallel with an education program for high school teachers
- Assist in Lehigh Valley High School Mathematics Contest (run session reviewing problems after contest) each year March 1995 - 1999, 2001, 2002
- Liaison to Marvine Elementary School, spring 2000.
- Secretary of Discrete Mathematics Activities group, SIAM (Society for Industrial and Applied Mathematics) elected fall 1999 to term 2000 - 2002.
- Member American Mathematical Society (AMS), Mathematical Association of America (MAA), Society of Industrial and Applied Mathematicians (SIAM), Institute for Operations Research and Management Science (INFORMS), Peace Science Society (PSSI)
- Journal reviewer (about 100 papers total), Discrete Mathematics, Discrete Applied Mathematics, Graphs and Combinatorics, Journal of Combinatorics Information and System Sciences, Journal of Combinatorial Theory series A, Journal of Computational and Applied Mathematics, Journal of Graph Theory, Journal of Mathematical Psychology, Mathematical Social Sciences, Order, SIAM Journal of Discrete Mathematics, Journal of computational and applied mathematics, Networks
- Reviewer for Mathematical Reviews, 40+ papers