Sarah Katherine Merz
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Education

University of Colorado at Denver 1995 Ph.D. Applied Mathematics
University of Colorado at Denver 1994 M.S. Applied Mathematics
Whitman College 1991 B.A. Mathematics, Phi Beta Kappa, (minors in Computer Science and Physical Education)

Thesis

"Competition graphs, p-competition graphs, two-step graphs, squares and domination graphs." Advisor: J. Richard Lundgren.

Professional Experience

Fall 2012 – present	Professor, University of the Pacific
Fall 2001- Spring 2012	Associate Professor, University of the Pacific
July 2006 – July 2009	Chair, Department of Mathematics
Fall 1995 - Spring 2001	Assistant Professor, University of the Pacific
Spring 1994 - Spring 1995	Teaching Assistant, University of Colorado, Denver
Fall 1991-Summer 1995	Research Assistant, University of Colorado, Denver

Research Interests: combinatorics, graph theory, theoretical computer science

Work in preparation: The Competition Graphs of Local Tournaments are Almost Interval.

Refereed Publications

The set chromatic number of a digraph (with L. Langley). To appear in *The Journal of Combinatorial Mathematics and Combinatorial Computing* (accepted 2015).

2015 A class of local tournaments with interval (1,2)-step competition graph (with K.A.S. Factor). *Congressus Numerantium*. 224: 33-38.

2013 The (1,2)-Step competition number of a graph. *Congressus Numerantium*. 215: 153-161. (with K.A.S. Factor and Yoshio Sano)

2011 The (1,2)-step competition graph of a tournament. *Discrete Applied Mathematics*. 159:100-103 (with K.A.S. Factor).

2006 Domination parameters and Gallai-type theorems for directed trees. *Ars Combinatoria*

81:201-207 (with J. Albertson[1], A. Harris[1], and L. Langley).

2004 Domination graphs with 2 or 3 nontrivial components. *The Bulletin of the Institute for Combinatorics and its Applications* 40:67-76 (with D. C. Fisher, D. Guichard, J.R. Lundgren, and K.B. Reid).

2003 The number of alpha-dominating sets in tournaments. *Congressus Numerantium* 162:183-192 (with L. Langley).

2003 Domination graphs of tournaments with isolated vertices. *Ars Combinatoria* 66: 299-311 (with D.C. Fisher, D. Guichard, J.R .Lundgren, K.B. Reid).

2002 Gallai-type theorems and domination in digraphs and tournaments (with D. Stewart[1]), *Congressus Numerantium* 154:31-41.

2002 Alpha-domination in tournaments and digraphs. *Congressus Numerantium* 157: 213-218 (with L. Langley, D. Stewart[1], and C. Ward).

2001 Domination graphs with nontrivial components, *Graphs and Combinatorics* 17(2):227-236 (with D.C. Fisher, D. Guichard, J.R. Lundgren,and K.B.Reid).

1999 Connected domination graphs of tournaments, *The Journal of Combinatorial Mathematics and Combinatorial Computing* 31:169-176 (with D.C. Fisher, J.R., Lundgren, and K.B. Reid).

1998 The domination and competition graphs of tournaments, *The Journal of Graph Theory* 29:103-110 (with D.C. Fisher, J.R. Lundgren, and K.B. Reid).

1997 The p-competition graphs of strongly connected and Hamiltonian digraphs, *Ars Combinatoria* 47:161-172 (with J.R. Lundgren, P.A. McKenna, L. Langley, and C.W. Rasmussen).

1997 The p-competition graphs of symmetric digraphs and p-neighborhood graphs, *The Journal of Combinatorics, Information and System Science* 22(2) (with J.R. Lundgren, P.A. McKenna, and C.W. Rasmussen).

1997 Posets with interval or chordal strict upper and lower bound graphs, *Congressus Numerantium* 125:153-160 (with L. Langley, J.R. Lundgren, and C.W. Rasmussen).

1995 A characterization of graphs with interval two-step graphs, *Linear Algebra and Its Applications* 217:203-223 (with J.R. Lundgren, J.S. Maybee, and C.W. Rasmussen).

1995 Chromatic numbers of competition graphs, *Linear Algebra and Its Applications*

[1] Pacific Undergraduate

217:225-239 (with J.R. Lundgren and C.W. Rasmussen).

1995 The competition graphs of interval digraphs, *Congressus Numerantium* 107:37-40 (with L. Langley and J.R. Lundgren).

1995 Competition graphs of strongly connected and Hamiltonian digraphs, *SIAM Journal on Discrete Mathematics* 8(2):170-185 (with K.F. Fraughnaugh, J.R. Lundgren, J.S. Maybee, and N.J. Pullman).

1995 Domination graphs of tournaments and digraphs, *Congressus Numerantium* 108:97-107 (with D.C.Fisher, J.R. Lundgren, and K.B.Reid).

1995 Interval p-neighborhood graphs, *Congressus Numerantium* 108:3-10 (with J.R. Lundgren, P.A. McKenna, and C.W. Rasmussen).

1994 New classes of p-competition graphs and phi-tolerance competition graphs, *Congressus Numerantium* 100:97-107 (with C.A Anderson, J.R.Lundgren, L.J. Langley, and P.A. McKenna).

1994 Elimination ordering characterizations of digraphs with interval and chordal competition graphs, *Congressus Numerantium* 103:55–64 (with J.R. Lundgren).

1993 A characterization of graphs with interval squares, *Congressus Numerantium* 98:132–142 (with J.R. Lundgren and C.W. Rasmussen).

Conference Proceedings

1997 The domination and competition graphs of tournaments. In the proceedings of the 16th Workshop in Pure Mathematics of the Korean Academic Council held at Hallym University in Korea, July 8-12, 1996 (with D.C. Fisher, J.R. Lundgren, and K.B. Reid).

1997 p-competition and p-neighborhood graphs. In the proceedings of the 16th Workshop in Pure Mathematics of the Korean Academic Council held at Hallym University in Korea, July 8-12,1996 (with L. Langley, J.R. Lundgren, P.A. McKenna and C.W. Rasmussen).

Selected Presentations

2016 The competition graph of a local tournament. 47th Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Florida Atlantic University (FAU) on March 9.

2015 The set chromatic number of a digraph. 46th Southeastern International Conference on Combinatorics, Graph Theory, and Computing, FAU.

2011 The (1,2)-step competition graph of a local tournament. 42nd Southeastern International Conference on Combinatorics, Graph Theory, and Computing, FAU.

2011 The (1,2)-step competition number of a graph. Joint meeting of the AMS-MAA, New Orleans.

2010 What do a food web and a radio communication network have in common? Invited presentation at the Pacific Mathematics Department Colloquium sponsored by the Math Club.

2010 Competition Graphs and their Generalizations. Invited presentation at the Mathematics Colloqium at Marquette University.

2010 The (1,2)-Step Competition Graph of a Tournament. Joint meeting of the AMS-MAA, San Francisco, CA.

2007 A Puzzle of Keys and a Problem in Graph Theory. Invited presentation at the Colloquium of the Mathematics Department at Sonoma State University, October.

2007 The Distinguishing Number of a Directed Graph. 38th Southeastern International Conference on Combinatorics, Graph Theory, and Computing, FAU.

2004 Directed trees satisfying a Gallai-type theorem. University of the Pacific Mathematics Colloquium, November.

2004 Directed trees satisfying a Gallai-type theorem. 35th Southeastern International Conference on Combinatorics, Graph Theory, and Computing, FAU.

2002 Gallai-type theorems and domination in digraphs and tournaments. 33rd Southeastern International Conference on Combinatorics, Graph Theory, and Computing, FAU.

2001 Alpha-domination in Tournaments. Center for Discrete Mathematics and Theoretical Computer Science Research and Education Institute, Connect Institute, Rutgers University (invited presentation).

1999 Connected Domination Graphs of Tournaments. Center for Discrete Mathematics and Theoretical Computer Science Research and Education Institute, Rutgers University.

1997 From Food Webs to Tournaments: A Look at Competition Graphs. Mathematics and Science Colloquium, the University of Puget Sound (invited presentation).

Courses Taught: Calculus I, Calculus II, Linear Algebra, Applied Linear Algebra, Graph Theory, Operations Research (Linear Programming), Discrete and Combinatorial Mathematics, Introduction to Abstract Mathematics, Finite Math and Calculus, Elements of Calculus, Mentor Seminar I, Undergraduate Research in Graph Theory