

Kevin G. Milans

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Research Interests

Discrete mathematics, combinatorics, and graph theory. Specific interests include extremal combinatorics, probabilistic combinatorics, combinatorial games, combinatorial algorithms, and computational complexity of combinatorial decision problems.

Appointments

2017- **Associate Professor**, Department of Mathematics, West Virginia University

2012-2017 **Assistant Professor**, Department of Mathematics, West Virginia University

2010-2012 **Visiting Assistant Professor**, Department of Mathematics, University of South Carolina

Education

August 2010 **University of Illinois at Urbana Champaign**, Ph.D. in Mathematics
Advisor: Professor Douglas B. West

December 2006 **University of Illinois at Urbana Champaign**, M.S. in Computer Science
Advisor: Professor Jeff Erickson

May 2002 **Carnegie Mellon University**, B.S. in Computer Science
Minor in Physics

Publications

- J. A. Long Jr., K. G. Milans, and A. Murano, Forbidden induced subgraphs and Gallai families, in preparation.
- K. G. Milans and M. C. Wigal, A dichotomy theorem for First-Fit on posets with forbidden subposets, *SIAM J. Discret. Math.*, to appear.
- K. G. Milans and M. C. Wigal, Online coloring a token graph, *Graphs Combin.*, to appear.
- J. Almeter, S. Demircan, A. Kallmeyer, K. G. Milans, R. Winslow, The 2-Ranking Numbers of Graphs. *Graphs Combin.*, 35 (2019), no. 1, 91–102. (From the 2015 Research Experience for Undergraduate Students at West Virginia University.)

- K. G. Milans, Monotone paths in dense edge-ordered graphs. *J. Comb.*, 8 (2017) no. 3, 423–437. (Special edition honoring Ron Graham’s 80 birthday.)
- L. Lu and K. G. Milans, Set families with forbidden induced subposets. *J. Combin. Th. Ser. A*, 136 (2015), 126–142.
- T. Johnston, L. Lu, and K. G. Milans, Boolean algebras and Lubell functions. *J. Combin. Th. Ser. A*, 136 (2015), 174–183.
- K. G. Milans, D. Stolee, and D. B. West, Ordered Ramsey Theory and Track Representations of Graphs. *J. Comb.* 6 (2015), no. 4, 445–456.
- G. Joret, P. Micek, K. G. Milans, W. T. Trotter, B. Walczak, and R. Wang. Tree-width and dimension. *Combinatorica*, 36(4):431450, 2016.
- P. Horn, K. G. Milans, and V. Rödl, Degree Ramsey numbers of closed blowups of trees. *Electronic Journal of Combinatorics* 21 (2014), Paper 2.5.
- J. Choi, K. G. Milans, and D. B. West, Linear Discrepancy of Chain Products and Posets with Bounded Degree. *Order*, 31(3) (2014), 291–305.
- A. V. Kostochka and K. G. Milans, Coloring clean and K_4 -free circle graphs. In János Pach, editor, *Thirty Essays in Geometric Graph Theory*, pages 399–414. Springer, 2013.
- D. W. Cranston, W. B. Kinnersley, K. G. Milans, G. J. Puleo, and D. B. West, Chain-making games in grid-like posets. *Journal of Combinatorics*, 3 (2012), 633–649.
- T. Jiang, K. G. Milans, and D. B. West, Degree Ramsey numbers for cycles and blowups of trees. *European J. Combin.*, 34 (2013), 414–423.
- F. Pfender, K. G. Milans, D. Rautenbach, F. Regen, and D. B. West, Cycle spectra of Hamiltonian graphs. *J. Combin. Th. Ser. B*, 102 (2012), 869–874.
- M. Ferrara, M. S. Jacobson, K. G. Milans, C. Tennenhouse, and P. S. Wenger, Saturation numbers for graph subdivision families. *J. Graph Theory*, 71 (2012), 416–434.
- W. B. Kinnersley, K. G. Milans, and D. B. West, Degree Ramsey numbers of graphs. *Combin. Probab. Comput.* 21 (2012), 229–253. Richard Schelp memorial issue.
- R. Downey, N. Greenberg, C. Jockusch, and K. G. Milans, Binary subtrees with few labeled paths. *Combinatorica* 31 (2011), 285–303.
- K. G. Milans, D. Schreiber, and D. B. West, Acyclic sets in k -majority tournaments. *Electronic Journal of Combinatorics* 18 (2011), Paper 122.
- J. Butterfield, T. Grauman, W. B. Kinnersley, K. G. Milans, C. Stocker, and D. B. West, Online degree-Ramsey theory. *Electronic Journal of Combinatorics* 18 (2011), Paper 136.
- D. W. Cranston, N. Korula, T. LeSaulnier, K. G. Milans, C. Stocker, and J. Vandenbussche, Overlap number of graphs. *J. Graph Theory*, doi: 10.1002/jgt.20596.
- G. Joret and K. G. Milans, First-Fit is Linear on Posets Excluding Two Long Incomparable Chains. *Order* 28 (2011), 455–464.
- D. P. Bunde, K. G. Milans, D. B. West, and H. Wu, Optimal strong parity edge-coloring of complete graphs. *Combinatorica* 28 (2008), 625–632.
- D. P. Bunde, E. W. Chambers, D. Cranston, K. G. Milans, and D. B. West, Pebbling and optimal pebbling in graphs. *J. Graph Theory* 57 (2008), 215–238.

- D. P. Bunde, K. G. Milans, D. B. West, and H. Wu, Parity and strong parity edge-colorings of graphs. *Congressus Numer.* 187 (2007), 193–213.
- K. G. Milans and B. Clark, The Complexity of Graph Pebbling. *SIAM J. Discret. Math.* 20(3) (2006), 769-798.

Presentations

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| November 2019 | “Longest Path Transversals”, AMS Fall Southeastern Sectional Meeting, University of Florida, Gainesville, FL. |
| March 2019 | “Forbidden induced subgraphs and Gallai vertices”, AMS Spring Southeastern Sectional Meeting, Auburn University, Auburn, AL. |
| March 2019 | “Forbidden induced subgraphs and Gallai vertices”, 50th Southeastern International Conference on Combinatorics, Graph Theory & Computing Boca Raton, FL. |
| October 2018 | “A Dichotomy Theorem for Greedy Chain Partitions”, AMS Fall Central Sectional Meeting, University of Michigan, Ann Arbor, MI. |
| January 2018 | “First-Fit chain partitions in partially ordered sets”, 2018 International Workshop on Graph Theory, Ewha Womans University, Seoul, Korea. |
| September 2017 | “Ordered star colorings”, AMS Fall Eastern Sectional Meeting, State University of New York at Buffalo, Buffalo, NY. |
| September 2017 | “First-Fit chain partitions in partially ordered sets”, WVU-China Workshop on Graph Theory, West Virginia University, Morgantown, WV. |
| April 2017 | “Online coloring blowups of a known graph”, AMS Spring Central Sectional Meeting, Indiana University, Bloomington, IN. |
| April 2017 | “Ordered star colorings”, AMS Spring Central Sectional Meeting, Indiana University, Bloomington, IN. |
| March 2017 | “Online coloring blowups of a known graph”, 48th Southeastern International Conference on Combinatorics, Graph Theory & Computing, Florida Atlantic University, Boca Raton, FL. |
| November 2016 | “Online coloring blowups of a known graph”, AMS Fall Southeastern Sectional Meeting, North Carolina State University, Raleigh, NC. |
| November 2016 | “Forbidden Induced Posets in the Boolean Lattice”, Department Talk, University of North Carolina at Greensboro, Greensboro, NC. |
| June 2016 | “Monotone paths in dense edge-ordered graphs”, SIAM Conference on Discrete Mathematics, Georgia State University, Atlanta, GA. |
| March 2016 | “Monotone paths in dense edge-ordered graphs”, ACO Seminar, Carnegie Mellon University, Pittsburgh, PA. |

- March 2016 “Monotone paths in dense edge-ordered graphs”, AMS Spring Southeastern Sectional Meeting, University of Georgia, Athens, GA.
- September 2015 “Monotone paths in dense edge-ordered graphs”, Combinatorics and its Applications, Miami University, Oxford, OH.
- June 2015 “Monotone paths in edge-ordered complete graphs”, Connections in Discrete Mathematics: A Celebration of the work of Ron Graham, Simon Fraser University, Burnaby, BC, Canada.
- May 2015 “Monotone paths in K_n ”, 28th Cumberland Conference, University of South Carolina, Columbia, SC.
- November 2014 “Tilings of Hypercubes”, AMS Fall Southeastern Sectional Meeting at University of North Carolina at Greensboro.
- June 2014 “Turán and Ramsey Results for Boolean Algebras”, West Fest: Celebrating 60 Years. Hosted by the Institute for Mathematics and its Applications, Minneapolis, MN.
- June 2014 “Forbidden Structures in the Boolean Lattice”, 2014 SIAM Conference on Discrete Mathematics, Posets minisymposium.
- March 2014 “Multicolor Degree Ramsey Numbers of Cycles”, AMS Southeastern Spring Sectional Meeting at University of Tennessee, Knoxville.
- October 2013 “Multicolor Degree Ramsey Numbers of Cycles”, AMS Fall Southeastern Sectional Meeting at University of Louisville.
- April 2013 “Turán and Ramsey Results for Boolean Algebras”, AMS Spring Sectional Meeting at Iowa State University.
- October 2012 “Forbidden Induced Posets in the Boolean Lattice”, AMS Fall Central Sectional Meeting at University of Akron.
- September 2012 “Forbidden Induced Posets in the Boolean Lattice”, ACO Seminar, Carnegie Mellon University, Pittsburgh, PA.
- September 2012 “Forbidden Induced Posets in the Boolean Lattice”, AMS Fall Eastern Sectional Meeting at Rochester Institute of Technology.
- September 2012 “Forbidden Induced Posets in the Boolean Lattice”, 4th Polish Combinatorial Conference.
- April 2012 “Sparse Ramsey Hosts”, Georgia Southern University, Department Colloquium.
- February 2012 “Sparse Ramsey Hosts”, West Virginia University, Department Colloquium.
- February 2012 “Sparse Ramsey Hosts”, University of Denver.
- February 2012 “Sparse Ramsey Hosts”, University of South Florida, Department Colloquium.
- February 2012 “Sparse Ramsey Hosts”, University of Rhode Island.

- October 2011 “First-Fit is Linear on $(\underline{r} + \underline{s})$ -free Posets”, Clemson Mini-Conference on Discrete Mathematics and Algorithms.
- October 2011 “First-Fit is Linear on $(\underline{r} + \underline{s})$ -free Posets”, Emory University.
- September 2011 “Binary Subtrees with Few Path Labels”, Carolina Math Seminar at USC Sumter.
- July 2011 “Degree Ramsey Numbers of Graphs”, two part lecture series, Freie Universität Berlin.
- April 2011 “Coloring Clean and K_4 -free Circle Graphs”, Atlanta Lecture Series in Discrete Mathematics III at Georgia Institute of Technology.
- March 2011 “Binary Subtrees with Few Path Labels”, AMS Southeastern Section Meeting at Georgia Southern University.
- March 2011 “First-Fit is Linear on $(\underline{r} + \underline{s})$ -free Posets”, Georgia Institute of Technology.
- February 2011 “Degree Ramsey Numbers of Graphs”, Virginia Commonwealth University.
- November 2010 “Acyclic Sets in k -majority Tournaments”, AMS Southeastern Section Meeting in Richmond, Virginia.
- October 2010 “Binary Subtrees with Few Path Labels”, Georgia Institute of Technology.
- October 2010 “Degree Ramsey Numbers of Graphs”, Emory University.
- June 2010 “First-Fit is Linear on $(\underline{r} + \underline{s})$ -free Posets”, SIAM Conference on Discrete Mathematics in Austin, Texas.
- February 2010 “Degree Ramsey Numbers of Graphs”, Simon Fraser University.
- January 2010 “Degree Ramsey Numbers of Graphs”, 2010 Joint Mathematics Meetings in San Francisco, California.
- December 2009 “Degree Ramsey Numbers of Graphs”, Mathematics Colloquium, University of Louisville.
- November 2009 “Acyclic Sets in k -majority Tournaments”, University of Colorado Denver.
- July 2009 “Cycle Spectra of Hamiltonian Graphs”, SIAM Annual Meeting 2009 in Denver, Colorado.
- May 2009 “Computational Complexity aspects of Graph Pebbling”, CanaDAM 2009 in Montreal, Quebec.
- April 2008 “Online Degree Ramsey Theory”, AMS Sectional Meeting at Indiana University, Bloomington.
- November 2007 “On-line Ramsey Theory”, Combinatorics Seminar, U. of Louisville.

April 2006 “Parity Edge Coloring of Graphs”, DISCMATH Seminar, Illinois State U.

Teaching

Fall 2019	Math 375, “Applied Modern Algebra” Math 545, “Number Theory 1”
Spring 2019	Math 571, “Combinatorial Analysis 1”
Fall 2018	Math 573, “Graph Theory” Math 261, “Differential Equations”
Spring 2018	Math 283, “Introduction to Concepts of Mathematics”
Fall 2017	Math 573, “Graph Theory” Math 545, “Number Theory 1”
Spring 2017	Math 773, “Extremal Combinatorics”
Fall 2016	Math 573, “Graph Theory”
Spring 2016	Math 293E, “Math Reasoning”, Math 645, “Number Theory 2”
Fall 2015	Math 375, “Applied Modern Algebra”, Math 545, “Number Theory 1”
Spring 2015	Math 773, “Advanced Topics in Graph Theory”,
Fall 2014	Math 261, “Elementary Differential Equations”, Math 573, “Graph Theory”
Spring 2014	Math 373/578, “Introduction to Cryptography”
Fall 2013	Math 251, “Multivariable Calculus” Math 545, “Number Theory 1”
Spring 2013	Math 571, “Combinatorial Analysis 1”
Fall 2012	Math 343, “Introduction to Linear Algebra” Math 375, “Applied Modern Algebra”
Spring 2012	Math 242, “Elementary Differential Equations” Math 122, “Calculus for Business Administration and Social Sciences”
Fall 2011	Math 374, “Discrete Structures” Math 122, “Calculus for Business Administration and Social Sciences”
Spring 2011	Math 374, “Discrete Structures” Math 122, “Calculus for Business Administration and Social Sciences”

Fall 2010	Math 122, “Calculus for Business Administration and Social Sciences”
Spring 2009	Teaching assistant for Math234, “Calculus for Business I”
Fall 2008	Teaching assistant for Math231, “Calculus II”
Summer 2008	Co-instructor for CS273, “Theory of Computation” Small lecture format; approximately 20 students.
Spring 2008	Co-instructor for CS173, “Discrete Structures” Large lecture format; approximately 120 students.
Fall 2007	Teaching assistant for Math221, “Calculus I”
Summer 2007	Designer and instructor for Theory Bridge Course Distance learning format; provides distance masters students with the discrete math background necessary for a graduate course in algorithms.
Spring 2007	Teaching assistant for CS473g, “Graduate Algorithms”
Fall 2006	Teaching assistant for CS473ug, “Undergraduate Algorithms”
Fall 2004	Teaching assistant for CS375, “Formal Models of Computation”
Spring 2004	Teaching assistant for CS373, “Combinatorial Algorithms”
2002-2003	Teaching assistant for CS421, “Programming Languages”
Fall 2001	Teaching assistant for CS15-412, “Operating Systems”, Carnegie Mellon University

Honors, Awards, Grants, and Fellowships

April 2019	Internal Grant, WVU Mathematics Excellence in Research Fund, Tight Monotone Paths in Hypergraphs; PI. (\$8517)
July 2014	Grant to support REU Site: Graph Theory and Combinatorics at WVU; co-PI. (\$119,883)
January 2014	Grant to support the 27th Cumberland Conference on Combinatorics, Graph Theory, and Computing; co-PI. (\$12,680)
July 2011	AMS-Simons Travel Grant. (\$4,000)
September 2010	MSRI Travel Award to attend the BIRS workshop “New trends on structural graph theory” in Banff, Alberta, Canada.
August 2010	Fellowship to attend the conference in honor of the 70th birthday of Endre Szemerédi in Budapest, Hungary.

June 2010	SIAM Student Travel Award to attend the SIAM Conference on Discrete Mathematics in Austin, TX.
January 2010	AMS Travel Award to attend the Joint Mathematics Meetings in San Francisco, CA.
November 2009	IPAM award to attend the IPAM workshop “Topics in Graphs and Hypergraphs”.
August 2009	Dissertation Completion Fellowship; awarded by Mathematics Department and funded by the National Science Foundation.
Spring 2009	List of Teachers Ranked as Excellent by their Students; Outstanding ratings designation.
May 2009	CanaDAM Student Funding Committee award to attend CanaDAM 2009, Montreal.

Mentoring

- Current Graduate Students: James A. Long Jr. (Ph.D.), Caleb Devine (Ph.D.)
- Current Undergraduate Advisees: Jackson Porter (capstone student), John Bright
- Advisor, Michael Wigal, *Characterization of subexponential posets for First-Fit*, undergraduate capstone project, 2016–2017.
- Advisor, Nurul Wahyuni, *Chebyshev Polynomials and Fibonacci Numbers*, Master’s thesis, 2016.
- Co-advisor, Samet Demircan, *2-Ranking of Graphs*, undergraduate capstone project, 2015.
- Advisor, Dustin Snider, *An Exploration of Ramsey’s Theorem*, undergraduate capstone project, 2015.
- Member of Ph.D. committee (non-advisor): Janet Anderson (2016–2017).

Service Activities

- WVU Mathematics Department, Graduate Program Committee, Committee Member, Sep 2019-present.
- WVU Mathematics Department, Research Committee, Committee Member, Sep 2019-present.
- WVU Mathematics Department, Hiring Plan Committee, Committee Chair, Aug 2018-present.
- WVU Graduate Council, Committee Member, Aug 2018-present.
- WVU Mathematics Department, Faculty Evaluation Committee, Committee Member, Apr 2018-Sep 2019.
- WVU Mathematics Department, Undergraduate Program Committee, Committee Member, Oct 2014-May 2019.
- WVU Mathematics Department, Visiting Assistant Professor Search Committee Member, April 2018-May 2018.

- WVU Mathematics Department Strategic Planning Committee Member, Oct 2017-May 2018.
- WVU Mathematics Department Calculus Committee Member, Oct 2017-May 2018.
- WVU Mathematics Interim Undergraduate Program Director, Spring 2017.
- WVU Mathematics Department Assessment Committee Member, Oct 2016-May 2018.
- Co-organizer, 27th Cumberland Conference on Combinatorics, Graph Theory, and Computing, hosted at West Virginia University, May 2014. Supported by the WVU Mathematics Department and the NSF.
- Co-advisor, West Virginia University Pi Mu Epsilon and Math Club, Fall 2012-Sep 2019.
- Junior Faculty Mentor, University of Illinois Research Experience for Graduate Students (REGS) in combinatorics, Summer 2012.
- University of South Carolina Events Committee, Fall 2011-Spring 2012.
- University of South Carolina Pi Mu Epsilon faculty advisor, Fall 2010-Spring 2012.
- South Carolina High School Mathematics Contest Committee, Fall 2010-Spring 2012.
- Co-organizer, AMS Special Session on New Developments in Graph Theory (featuring 24 talks), AMS Southeastern Section Meeting, September 2011.
- Reviewer for grant proposals. *NSA Young Investigator Grant*: 5/2015.
- Referee for scholarly journals and conferences. *Israel J. of Math*: 1/2019; *ICALP*: 3/2018; *SODA*: 8/2015; *J. Graph Theory*: 10/2015, 4/2016; *Journal of Combinatorial Theory, Series A*: 6/2014, 7/2016, 10/2017, 10/2018; *Journal of Combinatorial Theory, Series B*: 11/2013, 9/2016; *SIAM J. on Disc. Math.*: 9/2011, 9/2011, 7/2013, 10/2014, 9/2017; *J. of Combin.*: 7/2011, 9/2017; *Discrete Mathematics & Theoretical Computer Science*: 7/2011; *Electronic J. of Combin.*: 6/2011, 8/2011, 2/2016, 10/2019; *Central European J. of Math.*: 2/2011, 6/2011; *Order*: 9/2010, 7/2011, 10/2016, 11/2018; *Discrete Mathematics*: 12/2007, 5/2009, 7/2009, 9/2009, 6/2010, 11/2010, 1/2011, 7/2011, 7/2015, 3/2017, 10/2018; *Journal of Graph Algorithms and Applications*: 5/2009; *Graphs and Combinatorics*: 2/2014; *European J. of Math.*: 10/2014; *Australas. J. Combin.*: 12/2016.
- Reviewer for AMS Mathematical Reviews, 9/2009-2016.
- Micro-teaching facilitator, U. of Illinois Graduate Academy for College Teaching, Fall 2009.
- Computer science and mathematics small group facilitator, TA orientation program, U. of Illinois Graduate Academy for College Teaching, Fall 2008.