

**Résumé:**

Wayne Goddard

**Personal Data:**

Professor

School of Computing & School of Mathematical and Statistical Sciences  
Clemson University  
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**Education:**

B.A., University of South Africa, 2002, Politics/Economics.  
Ph.D., Massachusetts Institute of Technology, 1992, Mathematics/Computer Science.  
Ph.D., University of Natal, Durban, 1989, Mathematics.  
B.Sc.Hon., University of Natal, Durban, 1986, Mathematics.  
B.Sc., University of Natal, Durban, 1985, Mathematics.

**Professional Experience:**

Clemson University

2019–, Chair of Faculty of Instruction, School of Computing  
2016–, Professor, School of Computing and School of Mathematical and Statistical Sciences  
2008–2016, Associate Professor, School of Computing and Dept Mathematical Sciences  
2002–2008, Associate Professor of Computer Science.

University of Johannesburg

2016–, Adjunct Professor, Dept of Mathematics and Applied Mathematics

University of Natal, Durban

1999–2002, Professor of Computer Science  
1994–1999, Associate Professor of Computer Science

ML Sultan Technikon, 1996–2001, Part-time lecturer in Computer Studies department.

University of Pennsylvania, 1992–1994, Lecturer, Department of Mathematics.

University of Natal, 1986–1987, Part-time lecturer, Department of Mathematics and Applied Mathematics.

National Research Institute for Mathematical Sciences, CSIR, Pretoria, 1983–84, Summer internship.

**Consulting Experience:**

Rogamur Solutions CC, 1995–2000. (Analysis of lotteries and gambling.)

Salbu (Pty) Ltd, 1987–1988. (Analysis of meteor-burst communication.)

## Memberships:

Fellow of The Institute of Combinatorics and its Applications; member of the Council (2020-23).

## Professional Activities:

Foundation for Research Development & ML Sultan Technikon Research Funding Committee, 1996–2000. NSF Panelist, 2016.

Program committee: 2004 International Workshop on Mobile Ad Hoc Networks and Interoperability Issues (MANETII'04);

IEEE International Workshop on Pervasive Computing and Ad Hoc Communications (PCAC'06);

WCIT'2006 (Wireless Communications and Information Technology in Developing Countries);

Third IEEE International Workshop on Heterogeneous Multi-Hop Wireless and Mobile Networks 2007 (IEEE MHWMN'07);

Jubilee Conference on Discrete Mathematics, Banasthali University India, 2009;

International Conference of Recent Trends in Graph Theory and Combinatorics, Cochin India, 2010;

IFIP World Information Technology Forum, 2016;

IEEE Graph Computing 2019–20;

Computer Consortium Small Colleges Southeastern Conference 2016–;

## Publications:

### *Books:*

S.W. Melville and W.D. Goddard, “Research Methodology: An introduction”, Juta, 1996. Second edition by W.D. Goddard and S.W. Melville, 2001.

W. Goddard, “Introducing the Theory of Computation”, Jones and Bartlett, 2008.

K.H. Rosen, D.R. Shier and W. Goddard (eds), “Handbook of Discrete and Combinatorial Mathematics (2nd ed)”, 2017.

### *Journal publications:*

j1. wg, J.H. Swart, and P.L. Spencer. The construction of Pythagorean triples with prescribed initial differences. *South African J. Science*, 81:524, 1985.

j2. wg and P.A. Winter. All graphs on a non-prime number of vertices are destructible. *Quaestiones Math.*, 8:381–385, 1986.

j3. wg and P.A. Winter. A characterization of stable graphs on a maximum (minimum) number of edges. *Quaestiones Math.*, 10:175–178, 1986.

j4. wg and H.C. Swart. The integrity of combinations of graphs. *J. Combin. Math. Combin. Comput.*, 4:3–18, 1988.

j5. S.W. Melville, J.D. Larsen, R.Y. Letschert, and wg. The classification of meteor trail reflections by a rule-based system. *Trans. SA IEE*, 80:104–116, 1989.

- j6. G. Chartrand, wg, M.A. Henning, L. Lesniak, H.C. Swart, and C. Wall. Which graphs are distance graphs? *Ars Combin.*, 29A:225–232, 1990.
- j7. J.D. Larsen, S.W. Melville, R. Mawrey, R.Y. Letschert, and wg. Throughput capacity of meteor burst communications. *Trans. SA IEE*, 81:20–30, 1990.
- j8. wg. The binding number of trees and  $K(1, 3)$ -free graphs. *J. Combin. Math. Combin. Comput.*, 7:193–200, 1990.
- j9. wg, O.R. Oellermann, and H.C. Swart. A new approach to distance stable graphs. *J. Combin. Math. Combin. Comput.*, 8:209–220, 1990.
- j10. wg and H.C. Swart. The integrity of a graph: bounds and basics. *J. Combin. Math. Combin. Comput.*, 7:139–151, 1990.
- j11. wg and H.C. Swart. On the toughness of a graph. *Quaestiones Math.*, 13:217–232, 1990.
- j12. L.W. Beineke, wg, P. Hamburger, D.J. Kleitman, M.J. Lipman, and R.E. Pippert. The integrity of the cube is small. *J. Combin. Math. Combin. Comput.*, 9:191–193, 1991.
- j13. G. Benadé, wg, T.A. McKee, and P.A. Winter. On distances between isomorphism classes of graphs. *Math. Bohem.*, 116:160–169, 1991.
- j14. wg. Acyclic colorings of planar graphs. *Discrete Math.*, 91:91–94, 1991.
- j15. wg, G. Kubicki, O.R. Oellermann, and S. Tian. On multipartite tournaments. *J. Combin. Theory Ser. B*, 52:284–300, 1991.
- j16. Binghuan Zhu and wg. An algorithm for outerplanar graphs with parameter. *J. Algorithms*, 12:657–662, 1991.
- j17. K.S. Bagga, L.W. Beineke, wg, M.J. Lipman, and R.E. Pippert. A survey of integrity. *Discrete Appl. Math.*, 37/38:13–28, 1992.
- j18. wg, M.A. Henning, and H.C. Swart. Some Nordhaus-Gaddum-type results. *J. Graph Theory*, 16:221–231, 1992.
- j19. wg and H.C. Swart. Two results on the binding numbers of products graphs. *Ars Combin.*, 34:119–128, 1992.
- j20. G. Chartrand, wg, M.A. Henning, F. Saba, and H.C. Swart. Principal common divisors. *Europ. J. Combin.*, 14:85–93, 1993.
- j21. H. Chen, wg, J. McCanna, and R. Poh. Path chromatic sequences of graphs. *Bull. Inst. Combin. Appl.*, 7:33–35, 1993.
- j22. wg, M.A. Henning, O.R. Oellermann, and H.C. Swart. Some general results on the framing number of a graph. *Quaestiones Math.*, 16:289–301, 1993.
- j23. wg, V. King, C. Kenyon, and L.J. Schulman. Optimal randomized algorithms for local sorting and set-maxima. *SIAM J. Comput.*, 22:272–283, 1993. Preliminary version in STOC, 1990.
- j24. wg and D.J. Kleitman. A note on maximal triangle-free graphs. *J. Graph Theory*, 17:629–631, 1993.
- j25. B. Aronov, P. Erdős, wg, D.J. Kleitman, M. Klugerman, J. Pach, and L.J. Schulman. Crossing families. *Combinatorica*, 14:127–134, 1994. Preliminary version in 7th Computational Geometry, 1991.
- j26. L.W. Beineke, wg, and P. Hamburger. Random packings of graphs. *Discrete Math.*, 125:45–54, 1994.
- j27. F.R.K. Chung, wg, and D.J. Kleitman. Even cycles in directed graphs. *SIAM J. Discrete Math.*, 7:474–483, 1994.
- j28. wg. Measures of vulnerability—the integrity family. *Networks*, 24:207–213, 1994.

- j29. wg and D.J. Kleitman. An upper bound on the Ramsey numbers  $r(K_3, G)$ . *Discrete Math.*, 125:177–182, 1994.
- j30. wg, E.M. Kubicka, G. Kubicki, and F. McMorris. The agreement metric for labeled binary trees. *Math. Biosci.*, 123:215–226, 1994.
- j31. wg, O.R. Oellermann, and H.C. Swart. Steiner distance stable graphs. *Discrete Math.*, 132:65–73, 1994.
- j32. wg. Mistilings with dominos. *Discrete Math.*, 137:361–365, 1995.
- j33. L.W. Beineke, wg, and M.J. Lipman. The edge integrity of cartesian products. *J. Combin. Math. Combin. Comput.*, 21:129–145, 1996.
- j34. G. Chartrand, wg, G. Kubicki, C.M. Mynhardt, and F. Saba. The greatest common divisor index of a graph. *J. Combin. Math. Combin. Comput.*, 20:11–26, 1996.
- j35. J. Dunbar, wg, M.A. Henning, S.T. Hedetniemi, and A.A. McRae. On algorithmic complexity of minus domination. *Discrete Applied Math.*, 68:73–84, 1996.
- j36. I. Gessel, wg, W. Shur, H. Wilf, and L. Yen. Counting pairs of lattice paths by intersections. *J. Combin. Theory Ser. A*, 74:173–187, 1996.
- j37. wg. The toughness of cubic graphs. *Graphs Combin.*, 12:17–22, 1996.
- j38. wg, M. Katchalski, and D.J. Kleitman. Forcing disjoint line segments in the plane. *Europ. J. Combin.*, 17:391–395, 1996.
- j39. wg and H.C. Swart. Distances between graphs via edge operations. *Discrete Math.*, 161:121–132, 1996.
- j40. L.W. Beineke, wg, and M.J. Lipman. Graphs with maximum edge integrity. *Ars Combin.*, 46:119–127, 1997.
- j41. L. Cowen, wg, and E. Jesurum. Defective colorings revisited. *J. Graph Theory*, 24:205–219, 1997. Preliminary version in SODA 97.
- j42. R. Entringer, wg, and M.A. Henning. Extremal graphs with cliques and independent sets. *J. Graph Theory*, 24:21–23, 1997.
- j43. wg, M.D. Plummer, and H.C. Swart. Maximum and minimum toughness of graphs of small genus. *Discrete Math.*, 167/168:329–339, 1997.
- j44. S. Brandt, R. Faudree, and wg. Weakly pancyclic graphs. *J. Graph Theory*, 27:141–176, 1998.
- j45. P. Dankelmann, wg, M.A. Henning, and H.C. Swart. Generalised eccentricity, radius and diameter in graphs. *Networks*, 34:312–319, 1999.
- j46. wg and M.A. Henning. Real and integer domination in graphs. *Discrete Math.*, 199:61–75, 1999.
- j47. wg, M.A. Henning, and H. Maharaj. Homogeneous embeddings of cycles in graphs. *Graphs Combin.*, 15:159–173, 1999.
- j48. wg, M.A. Henning, and O.R. Oellermann. Bipartite Ramsey numbers and Zarenkiewicz bounds. *Discrete Math.*, 219:85–95, 2000.
- j49. wg and G. Kubicki. Results about graph decomposition, greatest common divisor index for graphs and digraphs. *J. Combin. Math. Combin. Comput.*, 32:173–184, 2000.
- j50. wg, O.R. Oellermann, P. Slater, and H.C. Swart. Bounds on the total redundancy and efficiency of a graph. *Ars Combin.*, 54:129–138, 2000.
- j51. P. Dankelmann, D.J. Erwin, G. Fricke, wg, and H.C. Swart. Minimal and maximal  $e = 1$  functions. *J. Combin. Math. Combin. Comput.*, 36:127–138, 2001.
- j52. P. Dankelmann, wg, and P. Slater. Average distance in coloured graphs. *J. Graph Theory*, 38:1–17, 2001.

- j53. D. Day, wg, M.A. Henning, and H.C. Swart. Multipartite Ramsey numbers. *Ars Combin.*, 58:23–31, 2001.
- j54. wg and M.A. Henning. Pancyclicity of the prism. *Discrete Math.*, 234:139–142, 2001.
- j55. wg and G. Kubicki. Between packable and randomly packable graphs: Packer–spoiler graphs. *J. Combin. Math. Combin. Comput.*, 39:19–32, 2001.
- j56. P. Dankelmann, wg, O.R. Oellermann, and H.C. Swart. Augmentation to every 3 vertices in a cycle. *Discrete Applied Math.*, 116:145–159, 2002.
- j57. M. Denko and wg. Hierarchical cluster routing in mobile ad hoc networks. *UNISWA Research Journal of Agriculture, Science and Technology*, 6:81–90, 2002. Preliminary version in proceedings of the 5th International Conference on Communication systems (AFRICOM 2001), Cape Town, South Africa, May 2001.
- j58. M. Denko and wg. Limited flooding protocol for mobile ad hoc networks. *South African Computer Journal*, 19:49–57, 2002.
- j59. wg. 4-connected maximal planar graphs are 4-orderable. *Discrete Math.*, 257:405–410, 2002.
- j60. wg. A note on Steiner-distance-hereditary graphs. *J. Combin. Math. Combin. Comput.*, 40:167–170, 2002.
- j61. wg and M.A. Henning. Domination in planar graphs with small diameter. *J. Graph Theory*, 40:1–25, 2002.
- j62. E.J. Cockayne, O. Favaron, wg, P.J.P. Grobler, and C.M. Mynhardt. Changing upper irredundance by edge addition. *Discrete Math.*, 266:185–193, 2003.
- j63. E. Dalhaus, P. Dankelmann, wg, and H.C. Swart. MAD trees and distance-hereditary graphs. *Discrete Applied Math.*, 131:151–167, 2003.
- j64. wg. A computer/human Mastermind player using grids. *South African Computer Journal*, 30:3–8, 2003.
- j65. wg. Static Mastermind. *J. Combin. Math. Combin. Comput.*, 47:225–236, 2003.
- j66. wg, S.T. Hedetniemi, D.P. Jacobs, and P.K. Srimani. A self-stabilizing distributed algorithm for minimal total domination in an arbitrary system graph. In *Proceedings of 8th IPDPS Workshop on Formal Methods for Parallel Programming, Nice*, page 240, 2003.
- j67. wg and M.A. Henning. Nordhaus–Gaddum bounds for independent domination. *Discrete Math.*, 268:299–302, 2003.
- j68. wg, M. Raines, and P. Slater. Connectivity and distance measures in generalised prisms. *Discrete Math.*, 271:61–70, 2003.
- j69. I. Broere, M.S. Dorfling, wg, J.H. Hattingh, M.A. Henning, and E. Ungerer. Augmenting trees to have two disjoint total dominating sets. *Bull. Inst. Combin. Appl.*, 42:12–18, 2004.
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- j71. P. Dankelmann, wg, and C.S. Swart. The average eccentricity of a graph and its subgraphs. *Util. Math.*, 65:41–51, 2004.
- j72. O. Favaron, G. Fricke, wg, S.M. Hedetniemi, S.T. Hedetniemi, P. Kristiansen, R. Laskar, and D. Skaggs. Offensive alliances. *Discuss. Math. Graph Theory*, 24:263–275, 2004.
- j73. M. Gairing, wg, S.T. Hedetniemi, and D.P. Jacobs. Self-stabilizing maximal  $k$ -dependent sets in linear time. *Parallel Process. Lett.*, 14:75–82, 2004.
- j74. M. Gairing, wg, S.T. Hedetniemi, P. Kristiansen, and A.A. McRae. Distance-two information in self-stabilizing algorithms. *Parallel Processing Letters*, 14:387–398, 2004.
- j75. Z. Shi, wg, and S.T. Hedetniemi. An anonymous self-stabilizing algorithm for 1-maximal inde-

- pendent set in trees. *Inform. Process. Lett.*, 91:77–83, 2004.
- j76. wg. Mastermind revisited. *J. Combin. Math. Combin. Comput.*, 51:215–220, 2004.
- j77. wg. Minimum degree conditions for cycles including specified sets of vertices. *Graphs Combin.*, 20:467–483, 2004.
- j78. wg, T.W. Haynes, M.A. Henning, and L.C. van der Merwe. The diameter of total domination vertex critical graphs. *Discrete Math.*, 286:255–261, 2004.
- j79. wg, T.W. Haynes, and D. Knisely. Hereditary domination and independence parameters. *Discuss. Math. Graph Theory*, 24:239–248, 2004.
- j80. wg and M.A. Henning. Clique/connected/total domination perfect graphs. *Bull. Inst. Combin. Appl.*, 41:20–21, 2004.
- j81. M.S. Dorfling, wg, J.H. Hattingh, and M.A. Henning. Augmenting a graph of minimum degree 2 to have two disjoint total dominating sets. *Discrete Math.*, 300:82–90, 2005.
- j82. M.A. Henning and wg. Vertex coverings by coloured induced graphs—frames and umbrellas. *Quaestiones Math.*, 28:1–10, 2005.
- j83. Z. Shi, wg, S.T. Hedetniemi, K. Kennedy, R. Laskar, and A.A. McRae. An algorithm for partial Grundy number on trees. *Discrete Math.*, 304:108–116, 2005.
- j84. wg, S.M. Hedetniemi, and S.T. Hedetniemi. Eternal security in graphs. *J. Combin. Math. Combin. Comput.*, 52:169–180, 2005.
- j85. wg, S.M. Hedetniemi, S.T. Hedetniemi, and R. Laskar. Generalized subgraph-restricted matchings in graphs. *Discrete Math.*, 293:129–138, 2005.
- j86. wg, S.T. Hedetniemi, D.P. Jacobs, and P.K. Srimani. Self-stabilizing algorithms for orderings and colorings. *Internat. J. Found. Comput. Sci.*, 16:19–36, 2005. Also in APDCM’04.
- j87. wg, S.T. Hedetniemi, D.P. Jacobs, and P.K. Srimani. Self-stabilizing global optimization algorithms for large network graphs. *International Journal of Distributed Sensor Networks*, 1:329–344, 2005.
- j88. wg and M.A. Henning. Multiple vertex coverings by cliques. *J. Graph Theory*, 48:157–167, 2005.
- j89. wg, C.S. Swart, and H.C. Swart. On the graphs for with maximum distance or  $k$ -diameter. *Math. Slovaca*, 55:131–139, 2005.
- j90. J.R.S. Blair, wg, S.M. Hedetniemi, S.T. Hedetniemi, and S.B. Horton. Domination equivalence in graphs. *AKCE Int. J. Graphs Comb.*, 2:123–136, 2006.
- j91. P. Dankelmann, M.A. Henning, wg, and R. Laskar. Simultaneous graph parameters: Factor domination and factor total domination. *Discrete Math.*, 306:2229–2233, 2006.
- j92. M.S. Dorfling, wg, and M.A. Henning. Domination of planar graphs II. *Ars Combin.*, 78:237–255, 2006.
- j93. M.S. Dorfling, wg, M.A. Henning, and C.M. Mynhardt. Construction of trees and graphs with equal domination parameters. *Discrete Math.*, 306:2647–2654, 2006.
- j94. wg. A note on the integrity of trees. *Utilitas Math.*, 69:227–232, 2006.
- j95. wg and M.A. Henning. Restricted domination parameters in graphs. *J. Combin. Optim.*, 13:353–363, 2007.
- j96. wg and K. Kanakadandi. Orientation distance graphs revisited. *Discuss. Math. Graph Theory*, 27:125–136, 2007.
- j97. J.R.S. Blair, wg, S.T. Hedetniemi, S.B. Horton, P. Jones, and G. Kubicki. On domination numbers and reinforcement numbers in trees. *Discrete Math.*, 308:1165–1175, 2008.
- j98. P. Dankelmann, H.C. Swart, P. van den Berg, wg, and M.D. Plummer. Minimal claw-free graphs.

- Czechoslovak Math. J.*, 58(133):787–798, 2008.
- j99. A. Jamieson, wg, and S.T. Hedetniemi. On the Wimer method for designing edge-based algorithms. *AKCE Int. J. Graphs Comb.*, 5:115–125, 2008.
- j100. M. Springfield and wg. The existence of domino magic squares and rectangles. *Bull. Inst. Combin. Appl.*, 52:101–108, 2008.
- j101. wg. Automated bounds in recursive structures. *Utilitas Math.*, 75:193–210, 2008.
- j102. wg, S.M. Hedetniemi, S.T. Hedetniemi, J.M. Harris, and D.F. Rall. Broadcast chromatic numbers of graphs. *Ars Combin.*, 86:33–49, 2008.
- j103. wg, S.T. Hedetniemi, D.P. Jacobs, P.K. Srimani, and Z. Xu. Self-stabilizing graph protocols. *Parallel Process. Lett.*, 18:189–199, 2008.
- j104. wg, S.T. Hedetniemi, D.P. Jacobs, and V. Trevisan. Distance- $k$  knowledge in self-stabilizing algorithms. *Theor. Comput. Sci.*, 399:118–127, 2008.
- j105. J.R.S. Blair, wg, S.M. Hedetniemi, S.T. Hedetniemi, F. Manne, and D.F. Rall. Emergency response sets in graphs. *J. Combin. Math. Combin. Comput.*, 68:225–243, 2009.
- j106. J. Lyle and wg. The binding number of a graph and its cliques. *Discrete Appl. Math.*, 157:3336–3340, 2009.
- j107. wg and S.T. Hedetniemi. A note on trees, tables, and algorithms. *Networks*, 53:184–190, 2009.
- j108. wg and M.A. Henning. A characterization of cubic graphs with paired-domination number three-fifths their order. *Graphs Combin.*, 25:675–692, 2009.
- j109. wg, S.T. Hedetniemi, J. Huff, and A.A. McRae. Capacitated domination. *Ars Combin.*, 96:75–86, 2010.
- j110. wg and P.K. Srimani. Anonymous self-stabilizing distributed algorithms for connected dominating set in a network graph. In *Proceedings of The International Multi-Conference on Complexity, Informatics and Cybernetics: IMCIC 2010*, 2010.
- j111. E. DeLaVi na, wg, M.A. Henning, R. Pepper, and E.R. Vaughan. Bounds on the  $k$ -domination number of a graph. *Appl. Math. Lett.*, 24:996–998, 2011.
- j112. wg and J. Lyle. Dense graphs with small clique number. *J. Graph Theory*, 66:319–331, 2011.
- j113. wg, A. Sinko, P. Slater, and H. Xu. The graph distance game. *AKCE Int. J. Graphs Comb.*, 8:85–96, 2011.
- j114. B. Brešar, P. Dorbec, wg, B.L. Hartnell, M.A. Henning, S. Klavžar, and D.F. Rall. Vizing’s conjecture: a survey and recent results. *J. Graph Theory*, 69:46–76, 2012.
- j115. P. Dankelmann, D.J. Erwin, wg, S. Mukwembi, and H.C. Swart. Eccentric counts, connectivity and chordality. *Inf. Process. Lett.*, 112:944–947, 2012.
- j116. wg, S.M. Hedetniemi, S.T. Hedetniemi, and A.A. McRae. The algorithmic complexity of domination digraphs. *J. Combin. Math. Combin. Comput.*, 80:367–384, 2012.
- j117. wg, M.A. Henning, J. Lyle, and J. Southey. On the independent domination number of regular graphs. *Ann. Comb.*, 16:719–732, 2012.
- j118. wg and J. Lyle. Independent dominating sets in triangle-free graphs. *J. Combin. Optim.*, 23:9–20, 2012.
- j119. wg and P.K. Srimani. Self-stabilizing master-slave token circulation and efficient size-computation in a unidirectional ring of arbitrary size. *Internat. J. Found. Comput. Sci.*, 23:763–777, 2012. Also in APDCM’10.
- j120. wg and H. Xu. The  $S$ -packing chromatic number of a graph. *Discuss. Math. Graph Theory*, 32:795–806, 2012.

- j121. P. Dankelmann, wg, C.A. McPillan, and H.C. Swart. A note on extremal values of the scattering number. *Taiwanese J. Math.*, 17:1651–1658, 2013.
- j122. wg and M.A. Henning. Independent domination in graphs: A survey and recent results. *Discrete Math.*, 313:839–854, 2013.
- j123. wg, E.M. Kubicka, and G. Kubicki. An efficient algorithm for stopping on a sink in a directed graph. *Oper. Res. Lett.*, 41:238–240, 2013.
- j124. wg and K. Wash. ID codes in Cartesian products of cliques. *J. Combin. Math. Combin. Comput.*, 85:97–106, 2013.
- j125. P. Dankelmann, D.J. Erwin, wg, S. Mukwembi, and H.C. Swart. A characterisation of eccentric sequences of maximal outerplanar graphs. *Australas. J. Combin.*, 58:376–391, 2014.
- j126. wg, M.A. Henning, and C.A. McPillan. The disjunctive domination number of a graph. *Quaest. Math.*, 37:547–561, 2014.
- j127. wg, M.A. Henning, and C.A. McPillan. Semitotal domination in graphs. *Utilitas Math.*, 94:67–81, 2014.
- j128. wg and H. Xu. A note on  $S$ -packing colorings of lattices. *Discrete Appl. Math.*, 166:255–262, 2014.
- j129. wg, K. Wash, and H. Xu. Worm colorings. *Discuss. Math. Graph Theory*, 35:571–584, 2015.
- j130. wg and H. Xu. Fractional, circular and defective colorings of series-parallel graphs. *J. Graph Theory*, 81:146–153, 2016.
- j131. wg and H. Xu. Vertex colorings without rainbow subgraphs. *Discuss. Math. Graph Theory*, 36:989–1005, 2016.
- j132. R. Melville and wg. Coloring graphs to produce properly colored walks. *Graphs Combin.*, 33:1271–1281, 2017.
- j133. wg and R. Melville. Coloring subgraphs with restricted amounts of hues. *Open Math.*, 15:1171–1180, 2017.
- j134. wg and H. Xu. Vertex colorings without rainbow or monochromatic subgraphs. *J. Combin. Math. Combin. Comput.*, 102:109–122, 2017.
- j135. wg and M.A. Henning. The competition-independence game in trees. *J. Combin. Math. Combin. Comput.*, 104:161–170, 2018.
- j136. wg and M.A. Henning. The matcher game played in graphs. *Discrete Appl. Math.*, 237:82–88, 2018.
- j137. wg and M.A. Henning. A note on domination and total domination in prisms. *J. Combin. Optim.*, 35:14–20, 2018.
- j138. wg and M.A. Henning. Thoroughly dispersed colorings. *J. Graph Theory*, 88:174–191, 2018.
- j139. wg and R. Melville. Properly colored trails, path, and bridges. *J. Combin. Optim.*, 35:463–472, 2018.
- j140. wg and M.A. Henning. Acyclic total dominating sets in cubic graphs. *Appl. Anal. Discrete Math.*, 13:74–84, 2019.
- j141. wg, R. Melville, and H. Xu. Almost injective colorings. *Discuss. Math. Graph Theory*, 39:225–239, 2019.
- j142. A. Bachstein, wg, and C. Lehmacher. The generalized matcher game. *Discrete Appl. Math.*, 284:444–453, 2020.
- j143. wg and M.A. Henning. Independent domination, colorings and the fractional idomatic number of a graph. *Appl. Math. Comput.*, 382:125340, 8, 2020.



- j144. wg, K. Kuenzel, and E. Melville. Graphs in which all maximal bipartite subgraphs have the same order. *Aequationes Math.*, 94:1241–1255, 2020.
- j145. A. Bachstein, wg, and M.A. Henning. Bipartite domination in graphs. *Math. Pannon. (N.S.)*, 28:118–126, 2022.
- j146. A. Bachstein, wg, M.A. Henning, and J. Xue. Compelling colorings: A generalization of the dominator chromatic number. *Appl. Math. Comput.*, 428:127193, 2022.
- j147. R.M. Casablanca, P. Dankelmann, wg, L. Mol, and O. Oellermann. The maximum average connectivity among all orientations of a graph. *J. Combin. Optim.*, 43:543–570, 2022.
- j148. wg and M.A. Henning. Domination and dominator colorings in planar graphs with small diameter. *Discrete Appl. Math.*, 313:80–92, 2022.
- j149. wg, K. Kuenzel, and E. Melville. Well-hued graphs. *Discrete App. Math.*, 320:370–380, 2022.
- j150. wg and M.A. Henning. Independent domination in outerplanar graphs. *Discrete App. Math.*, 325:52–57, 2023.

*Book chapters:*

- b1. wg and O.R. Oellermann. Distance in graphs. In *Structural Analysis of Complex Networks*, pages 49–72. Birkhäuser, 2011.
- b2. wg. Binding number, cycles, and cliques. In *Graph Theory: Favorite Conjectures and Open Problems – 2*, pages 19–25. Springer, 2018.
- b3. wg and M.A. Henning. Fractional dominating parameters. In T.W. Haynes, S.T. Hedetniemi, and M.A. Henning, editors, *Topics in Domination in Graphs*, pages 349–263. Springer, 2020.
- b4. wg and M.A. Henning. Fractional domatic, idomatic, and total domatic numbers of a graph. In T.W. Haynes, S.T. Hedetniemi, and M.A. Henning, editors, *Structures of Domination in Graphs*, pages 79–99. Springer, 2021.

*Reviewed conference proceedings:*

- c1. wg, D.J. Kleitman, and D. Sturtevant. On the convergence of a nonlinear transform. *Congr. Numer.*, 82:179–185, 1991.
- c2. wg and O.R. Oellermann. The cycle structure of multipartite tournaments. In *Graph Theory, Combinatorics and Applications, Vol. 1, Y. Alavi et al. eds*, pages 525–533, 1991.
- c3. wg and H.C. Swart. On some extremal problems in connectivity. In *Graph Theory, Combinatorics, and Applications, Vol. 1, Y. Alavi et al. eds*, pages 535–551, 1991.
- c4. wg and G. Kubicki. The minimum size of agreement subtrees of two binary trees. *Congr. Numer.*, 97:131–136, 1993.
- c5. wg, E.M. Kubicka, G. Kubicki, and F. McMorris. Agreement subtrees, metrics and consensus for labeled binary trees. In *Partitioning Data Sets, Cox et al. eds*, pages 97–104, 1995.
- c6. wg and M.A. Henning. Generalised domination and independence. *Congr. Numer.*, 123:161–171, 1997.
- c7. L.W. Beineke, wg, and R. Vandell. More measures of vulnerability: Splinter sets and directed toughness. *Congr. Numer.*, 155:81–88, 2002.
- c8. K. Reddy, J. Kinyua, and wg. Deploying mobile agents to solve the distributed buying problem. In *Proceedings of ICAAI'03*, 2003.

- c9. wg, S.T. Hedetniemi, D.P. Jacobs, and P.K. Srimani. A robust distributed generalized matching protocol that stabilizes in linear time. In *Proceedings of ICDCS Workshop on Mobile Distributed Computing (MDC03), Rhode Island*, pages 461–465, 2003.
- c10. wg, S.T. Hedetniemi, D.P. Jacobs, and P.K. Srimani. Self-stabilizing distributed algorithm for strong matching in a system graph. In *HiPC*, volume 2913 of *LNCIS*, pages 66–73. Springer, 2003.
- c11. wg, S.T. Hedetniemi, D.P. Jacobs, and P.K. Srimani. Self-stabilizing protocols for maximal matching and maximal independent sets for ad hoc networks. In *Proceedings of 5th IPDPS Workshop on Advances in Parallel and Distributed Computational Models, Nice*, page 162, 2003.
- c12. Z. Xu, S.T. Hedetniemi, wg, and P.K. Srimani. A synchronous self-stabilizing minimal domination protocol in an arbitrary network graph. In *IWDC*, volume 2918 of *LNCIS*, pages 26–32. Springer, 2003.
- c13. J. Jacob, R. Laskar, and wg. The upper domination partition numbers of special graphs. *Congr. Numer.*, 182:65–77, 2006.
- c14. wg, S.T. Hedetniemi, D.P. Jacobs, and V. Trevisan. Distance- $k$  information in self-stabilizing algorithms. In Paola Flocchini and Leszek Gasieniec, editors, *Structural Information and Communication Complexity, 13th International Colloquium, SIROCCO 2006, Chester, UK, July 2-5, 2006, Proceedings*, volume 4056 of *LNCIS*, pages 349–356. Springer, 2006.
- c15. wg, S.T. Hedetniemi, and Z. Shi. An anonymous self-stabilizing algorithm for 1-maximal matching in trees. In *Proceedings of PDPTA '06*, volume II, pages 797–803, 2006.
- c16. J. Jacob, wg, and R. Laskar. Double vertex graphs and complete double vertex graphs. *Congr. Numer.*, 188:161–174, 2007.
- c17. wg, S.T. Hedetniemi, D.P. Jacobs, and P.K. Srimani. Anonymous daemon conversion in self-stabilizing algorithms by randomization in constant space. In S. Rao et al., editor, *Distributed Computing and Networking, 9th International Conference, ICDCN 2008, Kolkata, India, January 5-8, 2008*, volume 4904 of *LNCIS*, pages 182–190. Springer, 2008.
- c18. wg and P.K. Srimani. Self-stabilizing master-slave token circulation and efficient size-computation in a unidirectional ring of arbitrary size. In *24th IEEE International Symposium on Parallel and Distributed Processing, APDMCM Workshop Proceedings*, pages 1–8. IEEE, 2010.
- c19. wg and P.K. Srimani. Self-stabilizing master-slave token circulation and efficient topology computation in a tree of arbitrary size. In *25th IEEE International Symposium on Parallel and Distributed Processing, IPDPS 2011, Anchorage, Alaska, USA, 16-20 May 2011 - Workshop Proceedings*, pages 618–625. IEEE, 2011.
- c20. wg and P.K. Srimani. Daemon conversions in distributed self-stabilizing algorithms. In *WALCOM: Algorithms and computation*, pages 146–157. Springer, 2013.
- c21. wg, K. Wash, and H. Xu. Worm colorings forbidding cycles or cliques. *Congr. Numer.*, 219:161–173, 2014.

### Presentations at Conferences or Universities:

1. University of South Africa, 86
2. University of New Mexico, Aug87
3. “The integrity of a graph”, University of Western Michigan, Sep87
4. International Conference on Graph Theory, Combinatorics, Algorithms and Applications, Kalamazoo, Jun88
5. Indiana–Purdue University at Fort Wayne, Jun88

6. 255th Anniversary of Graph Theory, Durban, Jun91
7. "Partial Sorting" University of Natal, 91
8. South-Eastern Conference, Baton Rouge, Feb91
9. "An upper bound for the Ramsey numbers  $r(K_3, G)$ ", British Combinatorics Conference, Guildford, Jul91
10. Cumberland Conference, Memphis, May92
11. International Conference on Graph Theory, Combinatorics, Algorithms and Applications, Kalamazoo, Jun92
12. University of Delaware, 93
13. AMS Regional Meeting, Lexington, Mar94
14. Cumberland Conference, Huntsville, 94
15. "Measures of vulnerability", Twente University, Aug94
16. International Conference on Graph Theory, Combinatorics, Algorithms and Applications, Kalamazoo, Jun96
17. SIAM Conference on Discrete Mathematics, Baltimore, Jun96
18. Joint International Conference of the American Math. Soc., London Math. Soc., and South African Math. Soc., Pretoria, Jun97 (Invited address)
19. Annual congress of South African Mathematical Society, Auckland Park, 98
20. Czech-Slovak International Symposium on Combinatorics, Graph Theory, Algorithms and Applications Prague, Jul98
21. International Conference on Graph Theory, Combinatorics, Algorithms and Applications, Kalamazoo, Jun00
22. 43rd annual congress of South African Mathematics Society, Pretoria, Nov00.
23. South African International Graph Theory Conference, Ithala Game Reserve, Jun01
24. Annual congress of South African Mathematics Society, Westville, Nov01
25. "Mastermind and static Mastermind revisited", Clemson University, Feb02.
26. "The average eccentricity and the k-diameter of a graph", Vanderbilt University, Feb02
27. "The mathematics of Mastermind and static Mastermind", University of Alabama at Huntsville, Mar02
28. "Splinter sets", South Eastern Conference, Boca Raton, Feb02
29. "Static Mastermind", AMS Meeting, Atlanta, March02
30. Clemson Mini-conference, Clemson, Oct02
31. "Offensive alliances", ISCIS XVII, Orlando, Oct02
32. Cumberland Conference, Atlanta, May03
33. "Domination equivalence in graphs", University of Stellenbosch, June03
34. University of South Carolina, 2003
35. "Making computers count", North Carolina Mini-Conference, Boone, April04 (keynote speaker)
36. SIAM Southeast Atlantic Section meeting, 2004
37. "Trees, tables and theorems", Cumberland Conference, Johnson City, May06
38. "Anonymous deterministic self-stabilizing algorithms", SIAM Conference on Discrete Mathematics, Victoria, Jun06
39. "Automated bounds on recursive structures", Southeastern International Conference on Combi-

- natorics, Graph Theory, and Computing, Boca Raton, Mar07
40. “Almost tilings with T-tetrominoes”, Cumberland conference on Discrete Mathematics, Atlanta, May07
  41. “An introduction to self-stabilizing algorithms”, Network Science Conference, West Point, Oct07
  42. “Binding number, cycles and cliques revisited”, University of California San Diego, Mar08
  43. “Capacitated domination, tetrominoes, and computers”, SIAM Conference on Discrete Mathematics, Burlington, Jun08
  44. “ $L(2, 1)$ -graph coloring”, Canadian Discrete and Algorithmic Mathematics Conference, Montreal, May09
  45. “Aperiodic sequences and self-stabilizing algorithms”, SIAM Conference on Discrete Mathematics, Austin, Jun10
  46. “The S-packing chromatic number of a graph”, University of Louisville, Nov11
  47. “The S-packing chromatic number of a graph”, Joint SAMS and AMS conference, Port Elizabeth, Nov11
  48. “The binding number of a graph revisited”, Joint Mathematics Meeting, Boston, Jan12
  49. “The independent domination number of a graph revisited”, Atlanta Lecture Series in Combinatorics and Graph Theory, Feb12
  50. “Colorings with fractional defect”, SIAM Conference on Discrete Mathematics, Minneapolis, Jun14
  51. “WORM Colorings”, Midwest Conference on Combinatorics and Combinatorial Computing, Las Vegas, Oct14
  52. “How to color a graph with 2 colors (or even less)”, Colorings, Independence and Domination, Szklarska Poręba, Sep15
  53. “Colorings of graphs without rainbow or monochromatic subgraphs”, MCCCC, Charleston, Oct15.
  54. “Colorings of graphs without rainbow or monochromatic subgraphs”, AMS Sectional Meeting, New Brunswick, Nov15.
  55. “Graph colo(u)rings where subgraphs receive specified number of colo(u)rs”, South African Mathematical Society Annual Congress, Cape Town, Nov16.
  56. “Thoroughly distributed colorings”, MCCCC, Carrollton, Oct17
  57. “The matcher game played in graphs”, Cumberland Conference, Huntington, May18
  58. “Properly colored connections in graphs”, SIAM Conference on Discrete Math, Denver, Jun18
  59. “Competition parameters in graphs”, AMS Sectional Meeting, Auburn, Mar19
  60. “Bipartite domination in graphs”, International Workshop on Domination in Graphs, Ropar, Nov21
  61. “Bipartite domination in graphs”, AGH University of Science and Technology, Dec21
  62. “Bipartite versions of domination and independence”, AMS Section Meeting, Chattanooga, Oct22
  63. “Bipartite versions of domination and independence”, Southeastern Conference, Mar23

### Honors and Awards:

Presidential award from Foundation for Research Development, South Africa (1995)  
 Silver medal, South African Academy for the Advancement of Science (1997)

### Sponsored Research:

Office of Naval Research, PI=Wilf, Additional investigator, (1992–1994), N00014-91-J-1022.  
 Foundation for Research Development continued as National Research Foundation (South Africa), Grant-holder, (1995–1998).  
 Vice-Chancellor’s Research Award, University of Natal, approx \$15,000, (1996).  
 Research Award, Anonymous donor to the University of Natal, approx \$40,000, (2000–2002).  
 21st Clemson Mini-conference on Discrete Mathematics and Algorithms, National Security Agency, \$6,000 (2006).  
 22nd Clemson Mini-conference on Discrete Mathematics and Algorithms, National Science Foundation, \$10,000 (2007).  
 Autonomous Distributed Local Computing Models using Self-Stabilization, PI=Srimani, \$150,000 (my part is \$70,000) (2008–11).  
 2011 Clemson Mini-conference on Discrete Mathematics and Algorithms, National Security Agency, \$9,000.  
 2012 Clemson Mini-conference on Discrete Mathematics and Algorithms, National Security Agency, \$6,135.  
 2013–14 Clemson Mini-conference on Discrete Mathematics and Algorithms, National Security Agency, \$17,000.  
 2016 and 2017 Clemson Mini-Conference on Discrete Mathematics and Algorithms, National Security Agency, \$17,000.  
 2018 and 2019 Clemson Mini-Conference on Discrete Mathematics and Algorithms, National Security Agency, \$18,060.  
 2020 and 2021 Clemson Mini Conferences on Discrete Mathematics, National Security Agency, \$17,900.

**Graduate Student Advising:**

*Doctoral Graduates:*

Mieso Denko, “The design and implementation of routing protocols for mobile ad hoc networks” (2001)  
 Zhengnan Charlie Shi, “Self-stabilization protocols and distributed protocols in mobile ad hoc networks” (2005)  
 Jeremy Lyle, “Homomorphisms of graphs” (2008)  
 Jobby Jacob, “Variations on graph products and vertex partitions” (2009)  
 Kirsti Wash, “Identifying codes and domination in graph products” (2014)  
 Honghai Xu, “Generalized colorings of graphs” (2016)

*Masters Graduates:*

Supriya Bhargavan, “On ISDN and ATM Networks” (1996) [Thesis-only]  
 Tom Brazier, “Zero-knowledge interactive proof systems” (1997) [Thesis-only]  
 Christine Swart, “Distance measures in graphs and subgraphs” (1997) [Thesis-only]  
 Thiruthlall Nepal, “The time-tabling problem in tertiary institutions” (1998) [Thesis-only]  
 Kamil Reddy, “Using mobile agents to solve the distributed buying problem” (2002) [Thesis-only]  
 Anban Pillay, “Agent-oriented software engineering” (2003) [Thesis-only]

Kiran Kanakadandi, “On orientation distance graphs” (2006) [Thesis option]  
Michael Springfield, “Domino magic squares” (2006) [Paper option]  
Brent Nulph, “Nano-system programming” (2006) [Paper option]  
Nandita Gokale, “Super edge-magic labeling of disjoint stars” (2008) [Paper option]  
Honghai Xu, “S-packing coloring” (2011) [Paper option]  
Charles Pilman, “Disjunctive domination in graphs” (2011) [Paper option]  
Julia VanLandingham, “Generalized vulnerability measures of graphs” (2023) [Thesis option]

## Teaching:

### *Courses Taught:*

1986–1987, University of Natal: Operations Research.  
1992–1994, University of Pennsylvania: Calculus and Linear Algebra, Algebra, Mathematics for Liberal Arts, Graph Theory.  
1994–2002, University of Natal, Durban: Algorithms and Complexity Theory, Architecture, Artificial Intelligence, Complexity Theory, Computer Literacy, Computer Science 1A/1X, Intro System Software, Data Structures, Cryptography, Databases, Networks.  
1996–2001, ML Sultan Technikon: Artificial Intelligence, Networks, Research Methodology.  
2003–present, Clemson University, School of Computing: Complexity Theory, Data Structures, Artificial Intelligence, Algorithms, Java Programming, C Programming, Discrete Structures.  
2008–present, Clemson University, School of Mathematical and Statistical Sciences: Discrete Mathematics, Graph Theory, Linear Algebra and Matrix Theory, Vector Calculus, Mathematical Computing, Mathematical Modeling.

### *New Course Development:*

For several of the courses mentioned above, I developed materials, course notes, visual aids, etc, from scratch. In particular, I am author of in-house texts on Networks, Algorithms, Programming, Discrete Math, and Linear Algebra.

## University and Public Service:

### *Committees Past and Present:*

At the University of Natal:

*University-wide:* Broad Transformation Forum, Senate, University Timetabling Committee, Two Departmental Review Committees

*College:* Honours and Undergraduate Management, Faculty Planning, Timetabling, and Research,

At Clemson University:

*University-wide:* Faculty Senate, Academic Calendar Planning Committee, Student Conduct Code Review Committee, Graduate Fellowships, Graduate Council, Faculty Grievance Counselor, Undergraduate Academic Integrity Committee.

*College of Science:* Diversity Advocate on one search committee.

*School of Computing:* Advisory Committee, Research Committee, Awards Committee, Graduate Committee, departmental Webmaster, search committees.

*School of Mathematical and Statistical Sciences:* search committees; Graduate Committee; ad hoc Climate Committee.

*Other Service:*

Honorary faculty president, Science Students Council (1996) at University of Natal.

Co-Organizer, Clemson mini-conference (2005–).

### **Miscellaneous:**

Managing editor of *Discrete Mathematics* (2007–).

Member editorial board of *Utilitas Mathematica* (1999–2021); technical editor (1998), managing editor (graph theory) (2003–2007). Founder member editorial board, *AKCE International Journal of Graph Theory and Combinatorics* (2004–). Member editorial board of *Bulletin of Institute of Combinatorics and its Applications* (2018–).

Thesis examiner for: University of Cape Town, University of Pretoria, University of KwaZulu–Natal, Manonmaniam Sundaranar University, Bharathidasan University, National University of Singapore, University of South Africa, Indian Institute of Technology (Madras), University of Johannesburg, University of Madras.

External course moderator for: University of Durban-Westville, University of Zululand, ML Sultan Technikon.

External reviewer for: University of Cyprus, South African National Research Foundation, National Security Agency, National Science Foundation, Natural Sciences and Engineering Research Council of Canada, National Research Development and Innovation Office of Hungary.

***May 16, 2023***