

# CURRICULUM VITAE

Sandra M. Hedetniemi

## ADDRESSES

Department of Computer Science  
Clemson University  
Clemson, SC 29634-1906

Office: (864) 656-5869  
e-mail: [shedet@cs.clemson.edu](mailto:shedet@cs.clemson.edu)

100 Karen Drive  
Clemson, SC 29631-1727  
Home: (864) 654-9650

## EDUCATION

University of Virginia, Ph.D. Computer Science, 1977  
(Advisor: Stephen Hedetniemi)  
University of Virginia, M.S. Computer Science, 1973  
Centre College of Kentucky, B.A. Applied Mathematics, 1971

## EMPLOYMENT

Clemson University, Department of Computer Science (half-time appointment)  
Professor, August 1994–present  
Associate Professor, August 1982–August 1994  
Leaves of Absence:  
(January 1989 – August 1989, May 1984 – August 1986)

University of Oregon, Department of Computer and Information Science  
Associate Professor, September 1981–July 1982  
Assistant Professor, August 1978 – August 1981

University of Louisville, Department of Applied Mathematics and Computer Science  
Assistant Professor, August 1975–August 1978  
Instructor, June 1973–August 1973

University of Virginia, Department of Applied Mathematics and Computer Science  
Teaching and Research Assistant, September 1971–August 1975

## PUBLICATIONS

### 1975

- [1] S. Mitchell, S. Hedetniemi, and S. Goodman. Some linear algorithms on trees. *Proc. Sixth Southeastern Conf. on Combinatorics, Graph Theory and Computing, Util. Math.*, Winnipeg, 467-483, 1975.

### 1977

- [2] T. Beyer, A. Proskurowski, S. Hedetniemi, and S. Mitchell. Independent domination in trees, *Proc. Eighth Southeastern Conf. on Combinatorics, Graph Theory and Computing, Util. Math.*, Winnipeg, 321-328, 1977.
- [3] S. Mitchell and S. Hedetniemi. Edge domination in trees. *Proc. Eighth Southeastern Conf. on Combinatorics, Graph Theory and Computing, Util. Math.*, Winnipeg, 489-511, 1977.

### 1978

- [4] S. L. Mitchell. Another characterization of the centroid of a tree, *Discrete Math.* 24:277-280, 1978
- [5] A. Farley and S. Hedetniemi. Broadcasting in grid graphs. *Proc. Ninth Southeastern Conf. on Combinatorics, Graph Theory and Computing, Util. Math.*, Winnipeg, 275-288, 1978.

### 1979

- [6] S.L. Mitchell and S. T. Hedetniemi. Linear algorithms for edge colorings of trees and unicyclic graphs, *Inform. Process. Lett.* 9 110-112, 1979.
- [7] S. L. Mitchell, Linear Algorithms to recognize outerplanar and maximal outerplanar graphs, *Inform. Process. Lett.* 9(5) : 229 - 232, 1979
- [8] S.L. Mitchell, T. Beyer and W. Jones. Linear algorithms for isomorphism of outerplanar graphs, *J. Assoc. Comput. Mach.* 26 603-610, 1979.
- [9] S.L. Mitchell, E.J. Cockayne, and S.T. Hedetniemi. Linear algorithms on recursive representations of trees. *J. Comput. System Sci.* 18:76-85, 1979.
- [10] A. Farley, S. Hedetniemi, S. Mitchell, and A. Proskurowski. Minimum broadcast graphs. *Discrete Math.* 25:189-193, 1979.
- [11] S.L. Mitchell and S.T. Hedetniemi. Linear algorithms for edge colorings of trees and unicyclic graphs. *Inform. Process. Lett.* 9:110-112, 1979.
- [12] P. Chinn, S. Hedetniemi, and S. Mitchell. Multiple message broadcasting in complete graphs. *Proc. Tenth Southeastern Conf. on Combinatorics, Graph Theory and Computing, Util. Math.*, Winnipeg, 251-260, 1979.

## 1980

- [13] S.L. Mitchell and S.T. Hedetniemi. A census of minimum broadcast graphs. *J. Combin. Inform. System Sci.* 5:119-129, 1980.
- [14] T. Beyer, S.Mitchell. Constant time generation of Trees. *SIAM J. Comput.* 9:706-712, 1980.
- [15] A. Farley, S. Hedetniemi, and S. Mitchell. Rectilinear Steiner trees in rectangle trees. *SIAM J. Algebraic and Discrete Meth.* 1:70-81, 1980.
- [16] S.M. Hedetniemi, S.T. Hedetniemi, and P.J. Slater. Which grids are Hamiltonian? *Proc. Eleventh Southeastern Conf. on Combinatorics, Graph Theory and Computing, Util. Math.*, Winnipeg, 511-524, 1980.

## 1981

- [17] S.M. Hedetniemi, E.J. Cockayne, and S.T. Hedetniemi. Linear algorithms for the Jordan centre and path centre of a tree. *J. Transportation Science* 15:98-114, 1981.
- [18] S.M. Hedetniemi, S.T. Hedetniemi, and P.J. Slater. A note on packing trees into Kn. *Ars Combin.* 11:149-153, 1981.
- [19] T. Beyer, S.M. Hedetniemi, S.T. Hedetniemi, and A. Proskurowski. Graph traversal with minimum stack depth. *Proc. Twelfth Southeastern Conf. on Combinatorics, Graph Theory and Computing, Util. Math.*, Winnipeg, 121-130, 1981.

## 1982

- [20] S.M. Hedetniemi, S.T. Hedetniemi, and P.J. Slater. Centers and medians of Cn-trees. *Util. Math.* 21:225-234, 1982.
- [21] S.M. Hedetniemi and S.T. Hedetniemi. Vertex and edge deletion algorithms for trees. *J. Combin. Inform. System Sci.* 7:125-133, 1982.
- [22] T. Beyer, S.M. Hedetniemi, and S.T. Hedetniemi. A linear algorithm for the Grundy number of a tree. *Proc. Thirteenth Southeastern Conf. on Combinatorics, Graph Theory and Computing, Util. Math.*, Winnipeg, 351-363, 1982.

## 1983

- [23] S.M. Hedetniemi and S.T. Hedetniemi. Reducing space and time requirements for processing trees. *Congr. Numer.* 40:3-22, 1983.

## 1984

- [24] R. Laskar, J. Pfaff, S.M. Hedetniemi, and S.T. Hedetniemi. On the algorithmic complexity of total domination. *SIAM J. Alg. Disc. Meth.* 5:420-425, 1984.
- [25] S.M. Hedetniemi, S.T. Hedetniemi, and R. Laskar. Domination in trees: models and algorithms. In *Graph Theory with Applications to Algorithms and Computer Science*, Y. Alavi, G. Chartrand, L. Lesniak, D.R. Lick and C.E. Wall, Eds., (Kalamazoo, Mich., ), *Wiley-Intersci. Publ.*, New York, 423-442, 1984.

## 1985

- [26] S.M. Hedetniemi, A. Proskurowski and M. Syslo. Interior graphs of maximal outerplanar graphs. *J. Combin Theory(B)*. 38:156-167, 1985.

## 1988

- [27] S.M. Hedetniemi, S.T. Hedetniemi, and A.L. Liestman. A survey of gossiping and broadcasting in communication networks. *Networks* 18(4):319-359, 1988.

## 1990

- [28] S.M. Hedetniemi, S.T. Hedetniemi, and D.P. Jacobs. Private domination: theory and algorithms. *Congr. Numer.* 79:147-157, 1990.
- [29] S. M. Hedetniemi and H. Robinson, Successes despite extremely limited computing time in a primary classroom, *Proc. National Educational Computing Conference (NECC)*, 71-76 (1990).

## 1992

- [30] S. M. Hedetniemi, Using artificial intelligence concepts to teach problem solving, *Proc. National Educational Computing Conference (NECC)*, 218-222 (1992).

## 1993

- [31] S.M. Hedetniemi, S.T. Hedetniemi and D.P. Jacobs. Total irredundance in graphs: theory and algorithms. *Ars Combin.* 35A:271-284, 1993.

## 1995

- [32] G.H. Fricke, S.M. Hedetniemi, S.T. Hedetniemi, A.A. McRae, C.K. Wallis, M.S. Jacobson, H.W. Martin, and W.D. Weakley. Combinatorial problems on chessboards: a brief survey. *Ibid*, 507-528, 1995.
- [33] S.M. Hedetniemi, S.T. Hedetniemi, R. Laskar, A. McRae and A. Majumdar, Domination, independence and irredundance in total graphs: a brief survey, *Ibid*, 671-684, 1995.

## 1996

- [34] J. Dunbar, F. Harris, S.M. Hedetniemi, S.T. Hedetniemi, R. Laskar and A. McRae, Nearly perfect sets in graphs, *Discrete Math.* **138**: 229-246 (1996).

## 1997

- [35] J.H. Yan, G.J. Chang, S.M. Hedetniemi, and S.T. Hedetniemi.  $k$ -Path partitions in trees. *Discrete Appl. Math.* 78:227-233, 1997.
- [36] E.J. Cockayne, J.H. Hattingh, S.M. Hedetniemi, S.T. Hedetniemi, and A.A. McRae. Using maximality and minimality conditions to construct inequality chains. *Discrete Math.* 176:43-61, 1997.
- [37] S.M. Hedetniemi, S.T. Hedetniemi, and M.A. Henning. The algorithmic complexity of perfect neighborhoods in graphs. *J. Combin. Math. Combin. Comput.* 25:183-192, 1997.
- [38] A. Abdelbar and S. M. Hedetniemi, A parallel hybrid genetic algorithm simulated annealing approach to finding most probable explanations on baysian belief networks, *Proc. IEEE Int. Conf. on Neural Networks*, 450-455 (1997).

## 1998

- [39] A. Abdelbar and S. M. Hedetniemi, Approximation MAPs for belief networks is NP-hard and other theorems, *J. Artificial Intelligence*, **102** 21-38 (1998).
- [40] S.M. Hedetniemi, S.T. Hedetniemi, and R. Reynolds. Combinatorial problems on chessboards: II, Chapter 6 in *Domination in Graphs: Advanced Topics*, T.W. Haynes, S.T. Hedetniemi and P.J. Slater, Eds. *Marcel Dekker*, New York, 133-162, 1998.
- [41] E.J. Cockayne, S.M. Hedetniemi, S.T. Hedetniemi, and C.M. Mynhardt. Irredundant and perfect neighbourhood sets in trees. *Discrete Math.* 188:253-260, 1998.

## 1999

- [42] G.H. Fricke, T.W. Haynes, S.M. Hedetniemi, S.T. Hedetniemi, and M.A. Henning. On perfect neighborhood sets in graphs. *Discrete Math.* 199:221-225, 1999.
- [43] S.M. Hedetniemi, S.T. Hedetniemi, and D.P. Jacobs. Rank independent domination for trees. *Bull. Inst. Combin. Appl.* 27:62-68, 1999.

## 2000

- [44] J.E. Dunbar, S.M. Hedetniemi, S.T. Hedetniemi, D.P. Jacobs, J. Knisely, R.C. Laskar, and D.F. Rall. Fall colorings of graphs. *J. Combin. Math. Combin. Comput.* 33:257-273, 2000.
- [45] S.M. Hedetniemi, S.T. Hedetniemi, and D.F. Rall. Acyclic domination in graphs. *Discrete Math.* 222:151-165, 2000.
- [46] A.M. Abdelbar, S.T. Hedetniemi, and S.M. Hedetniemi. The complexity of approximating MAPs for belief networks. *J. Artificial Intelligence* 124:283-288, 2000.
- [47] T.W. Haynes, S.M. Hedetniemi, and S.T. Hedetniemi. Domination and independence subdivision numbers of graphs. *Discuss. Math. Graph Theory* 20(2):271-280, 2000.

## 2001

- [48] T.W. Haynes, S.M. Hedetniemi, S.T. Hedetniemi, D.P. Jacobs, J. Knisely, and L.C. van der Merwe. Domination subdivision numbers. *Discuss. Math. Graph Theory* 21(2):239-253, 2001.
- [49] J.R.S. Blair, S.M. Hedetniemi, S.T. Hedetniemi, and D.P. Jacobs. Self-stabilizing maximum matchings. *Congr. Numer.* 153:151-159, 2001.

## 2002

- [50] G.H. Fricke, T.W. Haynes, S.M. Hedetniemi, S.T. Hedetniemi, and R.C. Laskar. Excellent trees. *Bull. ICA* 34:27-38, 2002.
- [51] O. Favaron, S.M. Hedetniemi, S.T. Hedetniemi, and D.F. Rall. On k-dependent domination. *Discrete Math.* 249:83-94, 2002.
- [52] T.W. Haynes, S.M. Hedetniemi, S.T. Hedetniemi, and M.A. Henning. Power domination in graphs applied to electrical power networks. *SIAM J. Discrete Math.* 15(4):519-529, 2002.
- [53] O. Favaron, G. Fricke, W. Goddard, S.M. Hedetniemi, S.T. Hedetniemi, P. Kristiansen, R.C. Laskar, and D. Skaggs. Offensive alliances in graphs, *Proc. 17th Internat. Symp. Comput. Inform. Sci.*, I. Cicekli, N.K. Cicekli and E. Gelenbe, Eds., ISCIS, Orlando, FL, CRC Press, 298-302, 2002.
- [54] P. Kristiansen, S.M. Hedetniemi, and S.T. Hedetniemi. Introduction to alliances in graphs. *Ibid*, 308-312, 2002.

## 2003

- [55] G.H. Fricke, L.M. Lawson, T.W. Haynes, S.M. Hedetniemi, and S.T. Hedetniemi. A note on defensive alliances in graphs. *Bull. ICA* 38:37-41, 2003.
- [56] S.M. Hedetniemi, S.T. Hedetniemi, D.P. Jacobs, and P.K. Srimani. Self-stabilizing algorithms for minimal dominating sets and maximal independent sets. *Comput. Math. Appl.* 46:803-811, 2003.

## 2004

- [57] K.B. Reid, A.A. McRae, S.M. Hedetniemi, and S.T. Hedetniemi. Domination and irredundance in tournaments. *Australasian J. Combin.* 29:157-172, 2004.
- [58] E.J. Cockayne, P.A. Dreyer, Jr., S.M. Hedetniemi, and S.T. Hedetniemi. Roman domination in graphs. *Discrete Math.* 278:11-22, 2004.
- [59] S.M. Hedetniemi, S.T. Hedetniemi, and P. Kristiansen. Alliances in graphs. *J. Combin. Math. Combin. Comput.* 48:157-177, 2004.
- [60] S.M. Hedetniemi, S.T. Hedetniemi, A.A. McRae, D. Parks, and J.A. Telle. Iterated colorings of graphs. *Discrete Math.* 278:81-104, 2004.
- [61] O. Favaron, G. Fricke, W. Goddard, S.M. Hedetniemi, S.T. Hedetniemi, P. Kristiansen, R.C. Laskar, and R.D. Skaggs. Offensive alliances in graphs. *Discuss. Math. Graph Theory* 24:263-275, 2004.

## 2005

- [62] W. Goddard, S.M. Hedetniemi, and S.T. Hedetniemi. Eternal security in graphs. *J. Combin. Math. Combin. Comput.* 52:169-180, 2005.
- [63] W. Goddard, S.M. Hedetniemi, S.T. Hedetniemi, and R. Laskar. Generalized subgraph-restricted matchings in graphs. *Discrete Math.* 293:129-138, 2005.
- [64] J.R.S. Blair, W. Goddard, S.M. Hedetniemi, S.T. Hedetniemi and S.B. Horton, Domination equivalence in graphs, *AKCE Internat. J. Graphs Combin.* 2(2):123-136, 2005.

## 2006

- [65] J.E. Dunbar, D.J. Erwin, T.W. Haynes, S.M. Hedetniemi, and S.T. Hedetniemi. Broadcasts in graphs. *Discrete Appl. Math.* 154(1):59-75, 2006.
- [66] T.W. Haynes, S.M. Hedetniemi, S.T. Hedetniemi, J.R. Lewis and P.J. Slater, Differentials in graphs, *Util. Math.* 69:43-54, 2006.

## 2008

- [67] W. Goddard, S.M. Hedetniemi, and S.T. Hedetniemi, J. M. Harris and D. F. Rall. Broadcast Chromatic numbers of Graphs. *Ars Combin.* 86:33-49, 2008.
- [68] T.W. Haynes, S.M. Hedetniemi, S.T. Hedetniemi, A.A. McRae and P.J. Slater, Irredundant colorings of graphs, *Bull. ICA* 54:93-121, 2008.
- [69] S.M. Hedetniemi, S.T. Hedetniemi, D.F.Rall and J. Knisely, Secondary domination in graphs, *AKCE Internat. J. Graphs Combin.* 5(2): 103-115, 2008.
- [70] S.M. Hedetniemi, S.T. Hedetniemi, R.C. Laskar, L. Markus and P.J. Slater, Disjoint dominating sets in graphs, Proc. of Internat. Conf. Discrete Math., ICDM 2006, 7:87-100, Ramanujan Math. Soc. Lecture Notes Series No. 7 in Discrete Mathematics, 2008.

## To Appear:

- Jason T. Hedetniemi, Kevin D. Hedetniemi, Sandra M. Hedetniemi and Stephen T. Hedetniemi, Secondary domination in graphs II, *AKCE Internat. J. Graphs Combin.*,
- J. Blair, W. Goddard, S.M. Hedetniemi, S.T. Hedetniemi, F. Manne, and D. Rall, K-response sets, *J. Combin. Math. Combin. Comput.*,
- S.M. Hedetniemi, S.T. Hedetniemi, R. Laskar, A.A. McRae and C.K. Wallis, Dominator partitions of graphs, *J. Combin. Inform. Systems Sci.*,

## **Papers Submitted for Publication**

J.R.S. Blair, S.M. Hedetniemi, S.T. Hedetniemi, R.C. Laskar and H.B. Walikar, Generalized vertex covers in graphs, submitted.

E.J. Cockayne, P.A. Dreyer, S.M. Hedetniemi, S.T. Hedetniemi and A. McRae, The algorithmic complexity of Roman domination, submitted October 2005.

B.C. Dean, S.M. Hedetniemi, S.T. Hedetniemi, J.L. Mashburn and A.A. McRae, Matchability and k-maximal matchings, submitted October 2006.

J. T. Hedetniemi, K. D. Hedetniemi, S. M. Hedetniemi, and S. T. Hedetniemi, Secondary and internal distances in graphs II, submitted February 2009.

## **GRADUATE STUDENT SUPERVISION**

### **Doctoral Students**

Ashraf Abdelbar, Finding Most Probable Explanations Under Conditions of Uncertainty Using Bayesian Belief Networks, Dept. Computer Science, Clemson University, 1996.

### **Masters Students**

Keith Crigger, "Minimal Spanning Tree Algorithms", University of Louisville, 1977.

Bernard Benson, "Computer Aided Learning in Music Theory", University of Louisville, 1978.

Virginia Blake, "Query Processing in Distributed Database Systems", Clemson Univ., 1984.

Clifton James, "A Study of Natural Language Database Query Systems, Clemson Univ.

Ekkehard, Koehler, "Domination Problems in Three-dimensional Chessboard Graphs, Clemson Univ.

Croeze, Marcelino, "Data Compression", Clemson Univ.

Doetsch, Eric "Implementation and Comparison of Worst Case Red-Black Binary Trees and AVL Trees, Clemson Univ.

Glatt, George. 2005.