

REX K. KINCAID

Fall 2007

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**Personal Information**

Birth Date: March 31, 1956  
Marital Status: Married, 3 children

**Research Interests**

Continuous and Discrete Network Location Theory  
Metaheuristics for Discrete Optimization Problems  
Scale-Free Networks

**Education**

1984	Ph.D.	Operations Research, School of Industrial Engineering Purdue University, West Lafayette, IN. Ph.D. Dissertation: "Location of Central Structures in Networks" Advisors: Thomas L. Morin and Timothy J. Lowe
1980	M.S.	Applied Mathematics, Department of Mathematics Purdue University, West Lafayette, IN.
1978	B.A.	Mathematics (with honors) DePauw University, Greencastle, IN.

**Work/Consulting Experience**

1984 *Technology Management Corporation*: Developed two simulation models and aided in the analysis of a warehouse location/allocation study of the U.S. Postal Service.  
1981 *Nisus Corporation*: Aided in the design and analysis of software packages for small business environments.  
1977 *Eli Lilly Corporation*: Winter term internship. Assisted in design of a data base system.

**Teaching Experience**

From 1984 *College of William and Mary, Department of Mathematics*  
Assistant Professor (1984–1990) Associate Professor (1990–96) Full Professor (1996-present) Undergraduate and Graduate courses, topics including: Linear Programming, Discrete Optimization, Scale-Free Networks, Calculus, Simulation, and Computational Complexity.  
1992–1993 Lecturer, *Purdue University, School of Industrial Engineering*  
1982–1984 *Purdue University, School of Industrial Engineering*  
Graduate Instructor and Teaching Assistant  
1978–1982 *Purdue University, Department of Mathematics*  
Graduate Instructor, Course Coordinator, and Teaching Assistant

## **Professional Affiliations and Activities**

### **Society Membership**

InfORMS–Institute for Operations Research and the Management Sciences (1994-present)  
Operations Research Society of America (Associate 1982-90, Full 1990-1994)  
The Institute of Management Sciences (1993-1994) (In 1994 ORSA and TIMS merged forming a new society called InfORMS)  
Computer Science Technical Section of ORSA (1988-present)  
The Section on Locational Analysis of TIMS (1990-present)  
Mathematical Programming Society (1985-1987)  
Society of Industrial and Applied Mathematics (1986-1991)  
Decision Sciences Institute (1986-1988)  
New York Academy of Sciences (1987-1988)  
International Society for Structural and Multidisciplinary Optimization (1993-1999)

### **Service**

Editorial Advisory Board for *The Journal of Mathematical Modelling and Algorithms* 2002-present  
Associate Editor for *INFORMS Journal on Computing* 2002-present  
Editorial Advisory Board for *Computers and Operations Research*, 1996-2006.  
Program Committee member for InfORMS/Computer Science Technical Section conference in Dallas, TX, January 7-10, 1996.  
Vice-Chair of Membership for College on Locational Analysis, TIMS, 1993-1997.

### **Referee For**

8th AIAA Multidisciplinary Analysis and Optimization Proceedings (2000),  
AIAA Journal of Spacecraft and Rockets (2003)  
Algorithmica (1994),  
American Journal of Mathematics and Management Sciences (1989),  
Annals of Operations Research (1991,2002),  
Computers and Operations Research (1991–1994,1995,1997–2006),  
Environmental Modeling and Assessment (2003)  
European Journal of Operational Research (1989,1994,1996,1997,1998,2000,2002-2006),  
Geographical Analysis (1990,2003),  
IEEE Transactions on Systems, Man, and Cybernetics (1999),  
IIE Transactions on Scheduling and Logistics (1993),  
IEEE Journal of Robotics and Automation (1987),  
IEEE Potentials (2000),  
Information Systems and Operational Research (1989),  
Intl. J. of Operations and Quantitative Management (1998),  
Journal of Heuristics (1995),  
Location Science (1992,1995,1997,1998,1999),  
Naval Logistics Research Logistics (1986,1987,1996,1997,1999,2000),  
Networks (1989,1991,2000,2001),  
Operations Research (1992,1993,1994),  
Operations Research Letters (1990,1994),  
ORSA Journal on Computing (1990,1992,1995),

RAIRO-Recherche Operationnelle (1993), and  
Transportation Science (1988,1991).

### **Undergraduate Honors Theses Supervised and Supervised Research**

2005-2006—Michael Holroyd “Synchronizability and Connectivity of Discrete Complex Systems” High Honors (Mathematics)

2002-2003—Frank Curtis (jointly with Chi-Kwong Li) “Special Classes of 0-1 Matrices,” Highest Honors (Mathematics).

2002-2003—Mike Levy (jointly with Michael Trosset). “Computational Experiments with Two Response Methods for Stochastic Optimization,” High Honors (Mathematics).

Summer 2001—Lauren E. Nelson Verizon Scholarship project “An Optimization Model for Actuator Placement in Hyperthermia Treatment for Tumors,” presented at the Poster session of the 8th annual Verizon Undergraduate Research Symposium, Sept. 26, 2001.

1995-1996—Keith E. Laba, “Actuator Placement for Active Sound and Vibration Control,” High Honors (Mathematics)

1993-1994—Andrew Martin, “Local Search Heuristics and the Polymer Straightening Problem,” High Honors (Mathematics)

1991-92—Rosemary Berger, “Locating Structural Dampers on Flexible Space Truss Structures: A P-MaxMinSum Problem,” High Honors (Mathematics).

1990-91—Lynne G. Yellin, “Noxious Facility Locations: The P-Dispersion-Sum Problem,” High Honors (Mathematics).

### **Awards/Honors**

NASA’s Group Achievement Award, Active Structural Acoustic Control Flight Demonstration Team (8 members), Highest honor NASA bestows upon groups, 2000.

Omega Rho international honorary society (Purdue University Chapter) 1993.

College of William and Mary Alumni Fellow (awarded for excellence in teaching) 1990

NASA Faculty Fellowship Program 1989, 1990, 1992, 1993, 1995, 2002, 2003, 2004, 2005

David Ross Fellowship, Purdue Research Foundation 1983

Kappa Delta Pi (educational honorary) 1978

Honors Scholarship, DePauw University 1974-1978

### **University and Departmental Activities**

University Teaching Enhancement Project (2000-2001).

Member-CS Graduate Admissions and Retention Committee, 1998,2000-2002.

Member of Affirmative Action Committee, College of Arts and Sciences, 1987-1991 (University Committee 1988).

Colloquia Committee, Department of Mathematics, 1987-1989

Member—Merit Evaluation Committee, Mathematics, 1986-89, 1990-92, 1994, 2000, 2001, 2004.

Mathematics Concentrator Advisor, 1985-1992, 1994-1998,2000-2007.

Freshman Advisor, 1985-1987, 1989-1992, 1993-1996, 2003-2006.

Chair of Course Evaluation Committee, 1989-1991

Chair of Hiring Committee, Department of Mathematics, 1991, 2005.

Member of Personnel Committee, Dept. of Mathematics, 1991, 1993(chair), 1996, 1998, 2006, 2007.

MOST (mathematics organization for Students) advisor fall 1993  
Member of Academic Advisory Committee (College of William and Mary) 1995-1998.  
Graduate Director Computational Operations Research, 1995–1999,2000-present.  
Member of the Arts and Sciences Committee on Graduate Studies, 1995-1996,2002-present.  
Member of the Faculty Assembly (elected term 1995-1998).  
Member of Retention, Promotion, and Tenure Committee (School of Arts and Sciences)  
elected term 1996-1999.  
Member of Faculty Affairs Committee (elected term 2000-2002) Chair 2002  
Budget Advisory Group (appointed 2002)  
Dean’s Advisory Council (appointed 2002)

### **Research Grants and Contracts**

Virginia Space Grant Consortium Fellowship, \$14,000, May 21—July 27, 2007.  
NASA-NFFP Summer Faculty Fellowship Program with Multidisciplinary Optimization Branch, \$12,000, June 5—August 11, 2006.  
William and Mary Faculty Research Assignment. “The How and Why of Scale-free Networks,” 8/06–12/06. Total budget 90% of annual salary.  
NASA-LaRC, “Evaluating the Performance of Air Transport Networks \$13,337, September 22, 2005—May 21, 2006.  
William and Mary Faculty Research Assignment. “The How and Why of Scale-free Networks,” 8/05–12/05. Total budget 90% of annual salary.  
NASA-NFFP Summer Faculty Fellowship Program with Multidisciplinary Optimization Branch, \$12,000, June 6—August 12, 2005.  
NASA-NFFP Summer Faculty Fellowship Program with Multidisciplinary Optimization Branch, \$12,000, June 7—August 13, 2004.  
NASA-NFFP Summer Faculty Fellowship Program with Multidisciplinary Optimization Branch, \$12,000, June 2—August 8, 2003.  
NASA-NFFP Summer Faculty Fellowship Program with Satellite Data Production Facility, \$12,000, June 3—August 9, 2002.  
Reves Center International Travel Grant \$400 for ISOLDE IX.  
NASA-LaRC, “Bell-Curve Based Evolutionary Strategies for Structural Optimization,” (with Shelley Griffith and Ruth Sykes) \$42,245, August 1, 2000—July 31, 2001  
William and Mary Faculty Research Assignment. “Sensor/Actuator Placement Problems,” 8/99–5/00. Total budget 80% of annual salary.  
NASA-LaRC, “Bell-Curve Based Evolutionary Strategies for Structural Optimization,” (with Michael Weber) \$44,800, August 1, 1999—July 31, 2000  
NASA-LaRC, “Bell-Curve Based Evolutionary Strategies for Structural Optimization,” (with Michael Weber) \$41,902, August 1, 1998—July 31, 1999.  
NASA-LaRC, “Actuator Placement for Gust and Turbulence Control,” \$20,982, December 10, 1997—December 11, 1998.  
NASA-Virginia Consortium of Engineering and Sciences, August 1, 1997–July 31, 1998, Faculty Advisor, “Probabilistic Mating Rules in Genetic Algorithms,” Total award \$27,615.  
NASA-LaRC, “Actuator Placement for Active Sound and Vibration Control,” \$31,510, October 1, 1996–August 15, 1997.  
NASA-Virginia Consortium of Engineering and Sciences, August 1, 1996–July 31, 1997, Faculty Advisor, “Probabilistic Mating Rules in Genetic Algorithms,” Total award \$55,230. (I was responsible for generating one-half of this award.)

NASA-LaRC, “Actuator Placement for Active Sound and Vibration Control,” \$27,568, January 1–August 15, 1996.

NASA–ASEE Summer Faculty Fellowship, Multidisciplinary Optimization Branch, \$10,000, June 5 – August 11, 1995.

Roy R. Charles Center, “Curriculum Development—First Year Seminars,” \$600, May 16–27, 1994.

Faculty Research Award, “Molecular Optimization Problems,” \$5,700, Summer 1994.

NASA–ASEE Summer Faculty Fellowship, Chief Scientist NASA- LaRC, \$10,000, June 7 – August 13, 1993.

William and Mary Faculty Research Assignment, “Noxious Location Problems,” \$38,160, August 15–May 15, 1993.

NASA–ASEE Summer Faculty Fellowship, Interdisciplinary Research Office NASA- LaRC, \$10,000, June 1 – August 7, 1992.

NSF-REU Grant, “Undergraduate Research in Matrix Analysis and Applications,” \$40,000, June 1, 1991 – May 31, 1992 (faculty participant).

William and Mary Summer Research Assignment, “Metaheuristics for Discrete Network Location Problems,” \$4,400, Summer 1991.

NASA–ASEE Summer Faculty Fellowship, Interdisciplinary Research Office NASA- LaRC, \$9,000, June 4 – August 12, 1990.

NSF Travel Grant to attend ISOLDE V in Los Angeles, CA, \$400, June 1990.

NSF-REU Grant, “Undergraduate Research in Matrix Analysis and Applications,” \$32,000, June 1, 1990 – May 31, 1991 (principal investigator).

NASA–ASEE Summer Faculty Fellowship, Interdisciplinary Research Office NASA- LaRC, \$8,000, June 4 – August 12, 1989.

IPA Assignment to the U.S. Army Logistics Management College “Case Studies in Military Operations Research,” \$12,254, May 23 – July 15, 1988.

### Refereed Proceeding Publications

1. “An Interactive Approach to Network Location Problems”, *Proceedings of the American Society for Engineering Education 20th Annual Meeting*, Columbia, MO., March 20-22, 1985, pp. 87-94.
2. “An Investigation into the Method of Karmarkar” (with C.M. Klein), in *Northeast American Institute for Decision Sciences Proceedings*, 1986, pp. 199-201.
3. “Fuzzy Networks and Central Structure Locations” (with C.M. Klein), *Southeast Decision Sciences Institute Proceedings*, 1987, pp. 227-229.
4. “A Survey of Submodular Functions and Their Applications” (with C.M. Klein), *International Proceedings of AMSE Conference on Modeling and Simulation*, 1987, pp. 83-114.
5. “The Design of Material Handling Systems for Flexible Manufacturing Systems,” (with C.M. Klein) *Proceedings of the 20th Annual Modeling and Simulation Conference*, Pittsburgh, PA, May, 1989, pp. 443-446.
6. “Minimizing Distortion and Internal Forces in Truss Structures by Simulated Annealing,” (with S. Padula) *Proceedings of 31st Structures, Structural Dynamics and Materials Conference*, June, 1990, pp. 327-333.
7. “Minimizing Distortion in Truss Structures: A Comparison of Simulated Annealing and Tabu Search,” *Proceedings of 32nd Structures, Structural Dynamics and Materials Conference*, April, 1991, 424-430.
8. “The Damper Placement Problem for the CSI-Phase 1 Evolutionary Model,” (with C. Bloebaum) *Proceedings of 34th Structures, Structural Dynamics and Materials Conference*, April, 1993.

9. "Optimal Sensor/Actuator Locations for Active Structural Acoustic Control" (with S.L. Padula and D.L. Palumbo) AIAA paper 1998-1865, in *Proceedings of the 39th AIAA/ASME/ASCE/ AHS/ASC Structures, Dynamics and Materials Conference*, Long Beach, CA, April 20-24, 1998. AIAA Paper 98-1865.
10. "Bell-Curve Based Evolutionary Optimization Algorithm," with (J. Sobieszczanski-Sobieski and K. Laba) in *Proceedings of the 7th AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization*, St. Louis, MO, September 2-4, 1998. AIAA Paper 98-4971, pp. 2083-2096.
11. "Applications of Combinatorial Optimization for Sensor and Actuator Placement", (with S. Padula) Short Paper Proceedings of the Third World Congress of Structural and Multidisciplinary Optimization. May 17-21, 1999, Buffalo, NY, pp 323-325.
12. "Performance of a Bell-Curve Based Evolutionary Optimization Algorithm," (with M. Weber and J. Sobieski) AIAA paper 2000-1388, *Proceedings of the 41st AIAA Structures, Structural Dynamics, and Materials Conference*, April 2000.
13. "A Bell-Curve Based Algorithm for Mixed Continuous and Discrete Structural Optimization," (with M. Weber and J. Sobieski) AIAA Paper 2001-1550 (AIAA Accession number 25276); 42nd AIAA Structures, Structural Dynamics, and Materials Conference and Exhibit, Seattle, WA; April 2001.
14. "Bell-Curve Genetic Algorithm for Mixed Continuous and Discrete Optimization Problems," (with M. Griffith, R. Sykes and J. Sobieski) AIAA paper 2002-1675, *Proceedings of the 43rd AIAA Structures, Structural Dynamics, and Materials Conference*, April 2002.
15. "Bell-Curved Based Optimization for Mixed Continuous and Discrete Structural Optimization Problems," (with R. Sykes and J. Sobieski) AIAA paper 2003-1443, *Proceedings of 44th AIAA Structures, Structural Dynamics, and Materials Conference*, April 2003.
16. "Quasi-Newton methods for stochastic optimization,"(with M. Trosset and A. Dimnaku) *Proceedings of the Fourth International Symposium on Uncertainty Modeling and Analysis* September 21-24, 2003, pp. 304-309.
17. "Scale-free Networks: A Discrete Event Simulation Approach," (with N. Alexandrov) *Lecture Notes in Computer Science: Computational Science—ICCS 2005:5th International Conference, Atlanta, GA, USA, Proceedings*, Vol. 3514, pp. 1051-1058.
18. "Synchronizability and connectivity of discrete complex systems," (with Michael Holroyd) to appear in *Proceedings of the International Conference on Complex Systems 2006*, New England Complex Systems Institute, Quincy, MA. June (2006).
19. "Understanding the Structure of Power Law Networks," (with Christopher Gatz and Michael Holroyd) *Proceedings of Spring Simulation Multiconference*, Vol. 2, pp. 104-111, March 25-28, 2007, Norfolk, VA., ISBN 1-56555-314-4.
20. "Space Allocation Optimization at NASA Langley Research Center," (with Raymond Gates and Robert Gage) in *Proceedings of the Seventh Metaheuristics International Conference*, Montreal, CANADA, June 25-30, 2007.

#### Refereed Journal and Book Publications

1. "A New Model for Facility Location Problems" (with C.M. Klein), *Advances in Modeling and Simulation Enterprises Review*, **3**, 1986, pp. 19-32.
2. "The Location of Central Structures in Trees" (with T.J. Lowe and T.L. Morin), *Computers and Operations Research*, **15**, (1988) pp.103-113.
3. "Fuzzy Location Problems" (with C.M. Klein), in *Fuzzy Methodologies for Industrial and Systems Engineering*, G.W. Evans, W. Karwowski, and M.R. Wilhelm (editors), Elsevier Publishers, pp.59-72, 1988.
4. "Locating Mobile Servers on a Congested Network: A Simulation Analysis," (with K. Miller and S. Park) in *Impact of Recent Computer Advances on Operations*

- Research*, R. Sharda, B.L. Golden, E. Wasil, O. Balci, and W. Stewart (editors), Elsevier Publishing Co., New York, pp. 396-406, 1989.
5. "Locating A Point of Minimum Variance on Triangular Graphs," (with O. Maimon), *Transportation Science*, **23**, (1989) pp. 216-219.
  6. "Locating an Absolute Center on Graphs That Are Almost Trees," (with T.J. Lowe) *European Journal of Operational Research*, **44** (1990) pp. 357-372.
  7. "A Note on Locating a Central Vertex of a 3-Cactus Graphs," (with O.L. Maimon), *Computers and Operations Research*, **17** (1990) pp. 315-320.
  8. A Note on "Facility Location Problems on a Network under Multiple Criteria—Fuzzy Set Theoretic Approach," (with S. Chaudhry) *International Journal of System Science*, **21** (1990) pp. 2387-2391.
  9. "A Multistage Linear Array Assignment Problem," (with D.M. Nicol, D.R. Shier, and D. Richards) *Operations Research*, **38** (1990) pp. 993-1005.
  10. "Simulation Analysis of Mobile Servers on a Congested Network," (with K. Miller and S. Park) *American Journal of Mathematics & Management Sciences*, **12** (1992) pp. 43-64.
  11. "An Application of Simulated Annealing to Minimizing Surface Distortion and Internal Forces in Truss Structures," *Structural Optimization*, **4** (1992) pp. 55-61.
  12. "Simulation Analysis of Mobile Servers on a Congested Network," (with S. Park, K. Miller, and S. Harvey) in *Computer Science and Operations Research*, Pergamon Press, pp. 105-116, 1992.
  13. "Good Solutions to Discrete Noxious Location Problems via Metaheuristics," *Annals of Operations Research*, **40** (1992) pp. 265-281.
  14. "The P-Dispersion-Sum Problem: Results on Trees and Graphs" (with L.G. Yellin) *Location Science*, **1** (1993) pp. 171-186.
  15. "Minimizing Distortion in Truss Structures: A Comparison of Simulated Annealing and Tabu Search," *Journal of Structural Optimization*, **5** (1993) pp. 217-224.
  16. "The Damper Placement Problem on Space Truss Structures," (with R.T. Berger) *Location Science* **1** (1993) pp. 219-234.
  17. "The Discrete Anti-P-Center Problem", (with C.M. Klein) *Transportation Science* **28** (1994) pp. 77-79.
  18. "The Maxminsum Problem on Trees," (with R.T. Berger) *Location Science*, **2** (1994) pp. 1-10.
  19. "A Look-Ahead Heuristic for Scheduling Jobs with Release Dates on a Single Machine," (with W. Mao) *Computers and OR*, **21** (1994) pp. 1041-1050.
  20. "On-Line Scheduling Algorithms," (with W. Mao and A. Rifkin) *The Impact of Emerging Technologies on Computer Science and Operations Research*, A. Sofer and S. Nash (editors) (1995) pp. 157-171.
  21. "Solving the Damper Placement Problem using Local Search Heuristics," special issue of *OR Spektrum* on Applied Local Search, **17** (1995) pp. 149-158.
  22. "Heuristic Search for the Polymer Straightening Problem," (with J. Hinkley and A. Martin) *Computational Polymer Science*, **5** (1995) pp. 1-5.
  23. "An Analysis of Service Schedules for the Mobile  $k$ -Server Problem," (with W. Mao) *Location Science*, **3** (1995) pp. 107-124.
  24. "Location Problems in Active Sound and Vibration Control of Cylinders," *Studies in Locational Analysis*, Issue 9 (1996) pp. 69-70.
  25. "The Molecular Structure Matching Problem," *Computers and OR*, Issue 1, Vol. 24 (1997) pp. 25-35.
  26. "Quelling Cabin Noise in Turboprop Aircraft via Active Control," (with K. Laba and S. Padula) *J. of Combinatorial Optimization* **1**, Issue 3 (1997) pp. 1-22.
  27. "Determining the Number of Kanbans and Lotsizes in a Generic Kanban System: A Tabu Search Approach," (with A. Martin, T. Chang, and Y. Yih) *Annals of Operations Research*, **78** (1998) pp. 210-217.

28. "Reactive Tabu Search and Sensor Selection in Active Structural Acoustic Control Problems," (with K. Laba) *J. of Heuristics*, **4** (1998) pp. 199-220.
29. "Actuator Selection for the Control of Multi-Frequency Noise in Aircraft Interiors", (with S.L. Padula) in *Meta-Heuristics: Advances and Trends in Local Search Paradigms for Optimization*, edited by S. Voss, S. Martello, I. Osman, and C. Roucairol, Kluwer, 1999 pp. 111-124.
30. "Bell-curve based evolutionary optimization algorithm," (with J. Sobieski and K. Laba) *Structural Optimization*, **18**, No. 4 (1999) pp. 264-276.
31. "D-Optimal Designs for Sensor/Actuator Placement," (with S. Padula) *Computers and Operations Research* **29**, No. 6 (2001) pp. 701-713.
32. "Performance of a Bell-Curve Based Evolutionary Optimization Algorithm," (with M. Weber and J. Sobieski) *Structural and Multidisciplinary Optimization Journal* Vol.21, No.4, June (2001) pp.261-271.
33. "A Bell-Curve Based Algorithm for Mixed Continuous and Discrete Structural Optimization," (with M. Weber and J. Sobieski) *Structural Optimization* Vol. 24, No. 2, September (2002) pp. 98-105.
34. "Bell-Curve Genetic Algorithm for Mixed Continuous and Discrete Optimization Problems," (with M. Griffith, R. Sykes and J. Sobieski) *Structural and Multidisciplinary Optimization* Vol. 26, No. 6 (2004) pp. 396-405.
35. "Approximate Solutions of the Continuous Dispersion Problems," (with M. Trosset and A. Dimnaku) *Annals of Operations Research* Vol. 136, No. 1 (2005) pp. 65-80.
36. "Minimum Kolmogorov-Smirnov Test Statistic Parameter Estimates," (with M. Weber and L. Leemis) *Journal of Statistical Computation and Simulation*, Volume 76, Number 3, 2006, 195-206.
37. "Computational Experiments with Heuristics for two Nature Reserve Site Selection Problems," (with M. Jeske and C. Easterling) to appear in special issue of *Computers and Operations Research* dedicated to location theory.
38. "Determinant Optimization on Binary Matrices," (with F. Curtis) to appear in *American J. of Mathematics and Management Sciences*.
39. "Metaheuristics for Discrete Optimization," chapter in Operations Research and Management Science Handbook, A. Ravi Ravindran (ed.), Taylor and Francis, 2007 (expected).

### Technical Reports, Unrefereed Proceedings, and Working Papers

1. "An Investigation of Synchrony in Transport Networks," (with Natalia Alexandrov) NASA/TM-2007-214855.
2. "An Atypical ( $\mu + \mu$ ) Evolutionary Algorithm," (with M. Weber and J. Sobieski) under review for NASA technical memorandum (2004).
3. "Scale-free Graphs for General Aviation Flight Schedules," NASA technical memorandum (2003) November, NASA/CR-2003-212648. (<http://techreports.larc.nasa.gov/ltrs/ltrs.html>)
4. "Reactive Tabu Search for Location Problems in Quelling Cabin Noise in Turbo-prop Aircraft," *Proceedings of the 2nd International Conference on Metaheuristics*, Sophia Antipolis, France, July 21-24, 1997.
5. "Location Problems Arising in Active Sound and Vibration Control of Cylinders," in *Proceedings of 43rd North American Meetings of the Regional Science Association International*, November 1996.
6. "Actuator Placement for Active Sound and Vibration Control of Cylinders," in NASA Contractor Report 198210, 85, 1995.
7. "Aerospace Applications of Integer and Combinatorial Optimization," (with S.L. Padula) NASA Technical Memorandum 110210, 1995.
8. "The Molecular Matching Problem," in NASA Contractor Report 191544, 120-122, 1993.

9. "The Damper Placement Problem for Large Flexible Space Structures," in NASA Contractor Report 189691, 133-135, 1992.
10. "Material Handling Design for Flexible Manufacturing System: A Network Approach," (with O. Maimon) working paper.
11. "Minimizing Distortion in Truss Structures via Tabu Search," in NASA Contractor Report 182092, 71-72, 1990.
12. "Location of a Point That Minimizes the Variance Equity Measure on Triangular Graphs," (with O. Maimon) College of William and Mary, Department of Mathematics, 1987, Technical Report #89.10.
13. "Minimizing Distortion and Internal Forces in Truss Structures by Simulated Annealing," in NASA Contractor Report 181894, 95-102, 1989.
14. "Quasi-Efficiency and The Theory of Vector Maximization", (with T.J. Lowe and T.L. Morin) Research Memorandum Series 86-15, School of Industrial Engineering, Purdue University, West Lafayette, IN 47907.
15. "Finding Two-Centers of Graphs That Are Almost Trees," working paper (1986).

### **Invited and Contributed Talks**

1. "Relationships Between Efficient and Quasi-Efficient Solutions to Vector Maximization Problems", Mathematics Department Colloquium, College of William and Mary, December 1985.
2. "An Interactive Approach to Network Location Problems", ASEE 20th Annual Meeting, Columbia, MO., March, 1985.
- \*3. "Relationships Between Efficient and Quasi-Efficient Solutions to Vector Maximization Problems", NASA Langley Research Center, January 1986.
4. "An Investigation into the Method of Karmarkar", (with C.M. Klein) Northeast AIDS, Williamsburg, VA., March, 1986.
5. "Locating Absolute Centers on Treelike Graphs: A Transformation Approach", TIMS/ORSA Joint National Meeting, Los Angeles, CA., April 1986.
- \*6. "Is Karmarkar's Algorithm 50 Times Faster Than the Simplex Method", Systems Engineering Department Colloquium, University of Virginia, September, 1986.
- \*7. "Is Karmarkar's Algorithm 50 Times Faster Than the Simplex Method", Department of Mathematics and School of Business Joint Colloquium, Virginia Commonwealth University, April 1987.
- \*8. "Central Structure Location Problems," (with O. Maimon), TIMS/ORSA Joint National Meeting, St. Louis, MO., October 1987.
- \*9. "Research Directions in Location Theory," Decisions Sciences Institute National Meeting, Boston, MA., November 1987.
10. "Two Centers of Graphs That Are Almost Trees", TIMS/ORSA Joint National Meeting, New Orleans, LA., May 1987.
11. "The Vertex of Minimum Variance of 3-Cactus Graphs", (with O. Maimon) TIMS/ORSA Joint National Meeting, New Orleans, LA., May 1987.
12. "The Point of Minimum Variance on 3-Cactus Graphs", (with O. Maimon) International Symposium on Locational Decisions, Namur, Belgium, June 1987.
13. "Network Algorithms for a Processor Scheduling Problem," (with D. Shier and D. Nicol) TIMS/ORSA Joint National Meeting, Denver, CO., October 1988.
14. "Locating Mobile Servers on a Congested Network: A Simulation Analysis," (with K. Miller and S. Park) Conference on the Impact of Recent Computer Advances on Operations Research, Williamsburg, VA., January, 1989.

15. "Locating Mobile Servers on a Congested Network: A Simulation Analysis," (with K. Miller and S. Park) Mathematics Department Colloquium, College of William and Mary, January 17, 1989.
- \*16. "Optimization Models and Simulation Analysis: A Friendly Juxtaposition," Systems Engineering Department Colloquium, University of Virginia, February, 1989.
17. "The Design of Material Handling Systems for Flexible Manufacturing Systems," (with C.M. Klein) Presented at the 20th Annual Modeling and Simulation Conference, Pittsburgh, PA., May, 1989.
18. "Modeling Uncertainties in Coverage Models: Approaches and Validation," (with S. Chaudhry, R. Batta, and N.N. Krishnamurthy) CORS/TIMS/ORSA Joint National Meeting, Vancouver, Canada, May 1989.
19. "Solving Problems in Engineering Design by Discrete Optimization," Interdisciplinary Research Office, NASA Langley Research Center, Hampton, VA., May, 1989.
20. "Minimizing Distortion and Internal Forces in Truss Structures by Simulated Annealing," Interdisciplinary Research Office, NASA Langley Research Center, Hampton, VA., July, 1989.
- \*21. "Location Problems in Flexible Space Structures," TIMS/ORSA Joint National Meeting, New York, NY., October 1989.
- \*22. "Discrete Optimization Problems in Engineering Design," Department of Mathematics and Computer Science, Hampden-Sydney College, VA., April, 1990.
23. "Analysis of Discrete Obnoxious Location Problems," (with C.M. Klein) International Symposium on Locational Decisions, Fullerton, CA., June 1990.
24. "Minimizing Distortion in a Tetrahedral Truss Structure: Simulated Annealing versus Tabu Search," Interdisciplinary Research Office, NASA Langley Research Center, Hampton, VA., August, 1990.
25. "Minimizing Distortion in Truss Structures via Simulated Annealing and Tabu Search," TIMS/ORSA Joint National Meeting, Nashville, TN., May 1991.
26. "Simulation Analysis of Mobile Servers on a Congested Network," (with S.Park, K.Miller, S.Harvey) ORSA/CSTS Computer Science and Operations Research: New Developments in their Interfaces, Williamsburg, VA, January 1992.
27. "Locating Dampers on a Flexible Space Structure," (with R. Berger) TIMS/ORSA Joint National Meeting, Orlando, FL, April 1992.
28. "The  $p$ -dispersion-sum problem on Trees and Graphs" (with L. Yellin) TIMS/ORSA Joint National Meeting, Orlando, FL, April 1992.
- \*29. "Combinatorial Optimization Problems and Space Applications," Governor's School held at The College of William and Mary, Williamsburg, VA, July 1992.
30. "Discrete Optimization Techniques for the Damper Placement Problem in Large Flexible Space Structures," IRO/Structural Dynamics Division, NASA-Langley Research Center, Hampton, VA, July 1992.
31. "Heuristic Search and the Damper Placement Problem in Large Flexible Space Structures," School of Industrial Engineering, Purdue University, West Lafayette, IN, October 1992.
32. "Placement of Structural Dampers on Large Truss Structures," (with R. Berger) 39th North American Meeting of the RSAI, Chicago, IL, November 1992.
33. "Research Program Summary Presentation for IE697: Purdue Graduate Student Colloquium," Purdue University, West Lafayette, IN, January 19, 1993.
34. "Optimization Models and the Space Station Freedom," DePauw University, Greencastle, IN, March 1, 1993.
35. "Discrete Optimization Models for the Placement of Active and Passive Dampers on the Space Station Freedom," School of Industrial Engineering, University of Missouri, Columbia, MO, March 12, 1993.

- \*36. "Choosing the Correct Design Mode and Placement of Passive Dampers on Large Space Structures," CSTS sponsored session on heuristic search at TIMS/ORSA Joint National Meeting, Chicago, IL, May 1993.
- \*37. "Combinatorial Optimization Problems in the Life Sciences," Governor's School held at The College of William and Mary, Williamsburg, VA, July 2, 1993.
- 38. "Using Tabu Search to Determine the Number of Kanbans and Lotsizes in a Generic Kanban System," (with A. Martin, T. Chang, and Y. Yih) Symposium on Business Applications of Artificial Intelligence, McIntire School of Commerce, University of Virginia, Charlottesville, VA, November, 1993.
- 39. "The Molecular Matching Problem," ORSA/CSTS Conference: The Impact of Emerging Technology on Computer Science and Operations Research, Williamsburg, VA, January 1994.
- 40. "On-line Scheduling Algorithms," (with W. Mao and A. Rifkin) ORSA/CSTS Conference: The Impact of Emerging Technology on Computer Science and Operations Research, Williamsburg, VA, January 1994.
- 41. "Tabu Search and Combinatorial Optimization," Computer Science Department Colloquium, The College of William and Mary, February 1994.
- 42. "Heuristic Search Techniques for the Polymer Straightening Problem," (with A. Martin) TIMS/ORSA Joint National Meeting, Boston, MA, April 1994.
- 43. "Combinatorial Optimization," Governor's School held at The College of William and Mary, Williamsburg, VA, July 1994.
- 44. "Combinatorial Optimization," Governor's School held at The College of William and Mary, Williamsburg, VA, July 20, 1995.
- \*45. "Aerospace Applications of Integer and Combinatorial Optimization," (with S.L. Padula) invited presentation for the SIAM Annual Meeting, Charlotte, NC, October 1995.
- 46. "Actuator Placement for Active Sound and Vibration Control of Cylinders," INFORMS/CSTS conference on Computer Science and Operations Research: Recent Advances in the Interface, Dallas, TX, January 7-10, 1996.
- 47. "Actuator Placement for Active Sound Control of Commuter Jets," (with Keith E. Laba) INFORMS National Meeting, Washington DC, May 5, 1996.
- 48. "Location Problems in Active Sound and Vibration Control of Cylinders," ISOLDE VII, Edmonton, Alberta (CANADA) June 27, 1996.
- 49. "Application of a Tabu Search Heuristic on the Problem of Active Structural Acoustic Control," (with K.E. Laba and S.L. Padula) Interior Noise Workshop, NASA Langley Research Center, Sept. 10-12, 1996.
- 50. "Location Problems Arising in Active Sound and Vibration Control of Cylinders," 43rd North American Meetings of the Regional Science Association International, November 14-17, 1996 Arlington, VA.
- \*51. "Optimization Modeling in Active Sound and Vibration Control of Propeller Driven Aircraft," Virginia State University, November 21, 1996.
- \*52. "Location Problems Arising in Active Sound and Vibration Control of Cylinders," Systems Engineering Department, U. of Virginia, Charlottesville, VA, February 7, 1997.
- 53. "Reactive Tabu Search for Location Problems in Quelling Cabin Noise in Turbo-prop Aircraft," 2nd International Conference on Metaheuristics, Sophia Antipolis, France, July 21-24, 1997.
- 54. "Actuator Selection for Control of Aircraft Interior Noise," Multi-Disciplinary Optimization Branch, NASA Langley Research Center, July 31, 1997.
- \*55. "Actuator/Sensor Placement for Active Sound and Vibration Control in Turbo-prop Aircraft," Mechanical Engineering Graduate Seminar, Old Dominion University, October 10, 1997.

56. "Location Problems Arising in Active Sound and Vibration Control of Cylinders," INFORMS National Meeting, Dallas, TX, October 26-29, 1997.
57. "Tabu Search for Sensor/Actuator Location Problems for Active Noise Control," Sixth INFORMS CSTS Conference—Computer Science and Operations Research: Recent Advances in the Interface, January 7-9, 1998, Monterey, California.
58. "Application of Scaled COSA to a Protein Folding Problem" (with M. Fleischer) presented at Informs Cincinnati Meeting, May 4, 1999.
59. "Bell-Curve Based Evolutionary Optimization for Structural Optimization" (with M. Weber and J. Sobieszczanski-Sobieski) presented at Informs Cincinnati Meeting, May 4, 1999.
60. "Tabu Search and the Polymer Straightening Problem" (with D. Evans and J. Hinkley) presented at Informs Cincinnati Meeting, May 4, 1999.
61. "Actuator Placement for Gust and Turbulence Control of Aircraft" (with S. Padula) presented at Informs Cincinnati Meeting, May 4, 1999.
62. "Sensor and Actuator Locations Problems," (with S. Padula) presented at the 8th International Symposium On Locational Decisions in Coimbra, Portugal, June 23-30, 1999.
63. "Sensor and Actuator Placement Problems," presented in an invited session at the International Symposium on Combinatorial Optimization (CO2000) held at U. of Greenwich, London, U.K., July 12-14, 2000.
64. "An Atypical Evolutionary Algorithm for Structural Optimization," presented at the Informs National meeting San Antonio, TX, November 4-8, 2000.
64. "Computational Experience with an Evolutionary Search Procedure for MINLPs in Structural Optimization," (with Ruth Sykes) InfORMS National Meeting, Miami, FL, November 3-7, 2001 (session sponsored by the InfORMS Society on Computing).
65. "Pitfalls of Mathematical Modelling," Atmospheric Sciences Data Center seminar series, NASA-Langley Research Center, June 5, 2002.
66. "Approximate Solutions to the Continuous p-Dispersion Problem via Nonlinear Optimization," (with M. Trosset and A. Dimnaku) Ninth International Symposium on Locational Decisions, New Brunswick, Canada, June 13-18, 2002.
67. "Metaheuristics for Discrete and Continuous Optimization Problems," Atmospheric Sciences Data Center seminar series, NASA-Langley Research Center, July 29, 2002.
68. "Scheduling Theory and the Data Production Problem at ASDC," Atmospheric Sciences Data Center seminar series, NASA-Langley Research Center, July 31, 2002.
69. "Bell-Curve Based Optimization for Mixed Continuous and Discrete Structural Optimization Problems," (with M. Griffith, R. Sykes and J. Sobieski) presented at the *44th AIAA Structures, Structural Dynamics, and Materials Conference*, April 7-10, 2003, Norfolk, VA.
70. "Computational Experiments with the Maximal Expected Species Covering Model for Nature Reserve Site Selection," (with M. Jeske and C. Easterling) 50th Regional Science Association International Meeting, November 20-22, 2003, Philadelphia, PA..
71. "Scale-free networks: what are they and why are they important?" Multi-Disciplinary Optimization Branch, NASA-Langley Research Center, July 25, 2003.
72. "Formation of Scale-free networks: A Discrete-Event Simulation Approach," Multi-Disciplinary Optimization Branch, NASA-Langley Research Center, July 30, 2004.
73. "Computational Experiments Exploring the How and Why of Scale-Free Networks," Informs Computing Society Conference, January 5-7, 2005, Annapolis, MD.

74. "Computational Experiments with Heuristics for Two Nature Reserve Site Selection Problems," Informs Computing Society Conference, January 5-7, 2005, Annapolis, MD.
75. "Computational Experiments with Heuristics for Two Nature Reserve Site Selection Problems," Institute of Integrative Bird Behavior Studies, The College of William and Mary, March 30, 2005.
76. "Scale-Free Networks: A Discrete Event Simulation Approach," 5th International Conference on Computational Science, May 22-25, 2005, Atlanta, GA.
77. "Evaluating the Performance of Air Transport Networks," Aeronautics Systems Analysis Branch, NASA Langley Research Center. August 8, 2005
- \*78. "Evaluating the Performance of Air Transport Networks," NASA Peer Review of Systems Analysis Directorate, October 26, 2005, NASA Langley Research Center.
- \*79. "Evaluating the Performance of Air Transport Networks," Systems Engineering Department Colloquium, University of Virginia, October 28, 2005.
80. "Scale-Free Networks: A Discrete Event Simulation Approach," Informs National meeting, Nov. 13-16, 2005, San Francisco, CA.
81. "Design and Evaluation of Air Transport Networks," Aeronautics Systems Analysis Branch, NASA Langley Research Center. August 7, 2006
82. "Synchronization of Networks for Discrete Complex Systems," Informs National meeting, Nov. 5-8, 2006, Pittsburgh, PA.
83. "Airtransport Network Design", Spring Simulation Multiconference, Sponsored by Society for Modeling and Simulation International and ACM/SIGSIM March 25-28, 2007, Norfolk, VA.
84. "Space Allocation Optimization at NASA-LaRC," 7th Metaheuristics International Conference, June 25-29, 2007, Montreal, Canada.

(\*) denotes an invited talk

### **Other Conferences**

Attended ESRI International User Conference, June 18-22, 2007, San Diego, CA.  
 Attended AMS-SIAM conference on "The Mathematics of Stochastic Manufacturing Systems, Williamsburg, VA, June 17-21, 1996.  
 Attended "NASA/Air Force Symposium on Recent Experiences in Multidisciplinary Analysis and Optimization," Hampton, VA., September 1988.  
 Attended "3rd SIAM Conference on Discrete Mathematics," Clemson, SC., May 1986.  
 Attended "TIMS/ORSA Applied Probability Conference," Williamsburg, VA., Jan. 1985.