

CURRICULUM VITAE

Vidyadhar G. Kulkarni

Chairman, Department of Operations Research
University of North Carolina
Chapel Hill, NC 27599-3180
(919)962 3837

Previous Positions:

Professor in the Department of Operations Research, University of North Carolina at Chapel Hill, NC, August 1993 - .

Associate Professor in the Department of Operations Research, University of North Carolina at Chapel Hill, NC, August 1989 - June 1993.

Assistant Professor in Department of Operations Research, University of North Carolina at Chapel Hill, NC, July 1981 - July 1988.

Visiting Assistant Professor in College of Management, Georgia Institute of Technology, Atlanta, GA 30332, September 1980 - June 1981.

Education:

Ph.D. in Operations Research, Cornell University, August 1980

M.S. in Operations Research, Cornell University, August 1978

Bachelor of Technology, Department of Mechanical Engineering, Indian Institute of Technology, Bombay, India, June 1976.

Special Achievements and Awards.

Norman L. Johnson Professorship. Held a five year distinguished chaired professorship (July 1997 - July 2002) at the University of North Carolina, Chapel Hill.

US Patent: (1995) *Traffic Management in Packet Communications Networks*,
US Patent No. 5,434,848. (Co-inventors: Dr. P. Chimento and Dr. L. Gün.)

Graduate Textbook: (1995)
Modeling and Analysis of Stochastic Systems,
CRC Press, London, 619pp.

Undergraduate Textbook: (1999)
Modeling, Analysis, Design and Control of Stochastic Systems,
Springer, New York, 374pp.

Educational Software: (1999)
MAXIM: A collection of MATLAB m-files to accompany the undergraduate textbook,
MAXIMGUI: A graphical user interface to access MAXIM.
Available for free download on
<ftp://ftp.mathworks.com/pub/books/kulkarni/MAXIM.zip>
<ftp://ftp.mathworks.com/pub/books/kulkarni/MAXIMGUI.zip>

Research Grants:

Outsourcing Warranty and Repair Services, August 15, 2002, Jan 1, 2004, National Science Foundation, Co-Principal Investigator with Professor J. Swaminathan. \$149,820.

Quality Management, Sept 1, 2001 to August 31, 2002, IBM, RTP. \$39,425.

Integrated Testing and Manufacturing Operations at IBM PC Manufacturing Plant, May 15, 1999 to May 14, 2001, IBM, RTP. Co-Principal investigators: Professor Stidham and Provan. \$160,000.

Stochastic Fluid-Flow Models for Control of Communication Networks, Sept 1, 1994 to Aug 31, 1997, National Science Foundation, Co-Principal Investigator with Professor S. Stidham, Jr. \$275,045

Stochastic Fluid Flow Models for High Speed Networks, July 1, 1991 to August 30, 1992, IBM, Principal Investigator. \$30,874.

Computational Methods in the Analysis of Enumeration and Counting Problems with Applications to Manufacturing, April 1, 1990 to March 31, 1992, National Science Foundation, Co-Principal Investigator with Professor G.S. Fishman. \$157,849.

Routing Algorithms for Data Transmission Networks, July 1, 1990 to June 30, 1991. IBM, Co-Principal Investigator with Professor G.S. Fishman and Professor S. Stidham, Jr. \$253,682.

Research in Reliability, Availability and Maintainability for Complex Failure Systems and Partially Observable Markov Chain Methods for the Study of Availability of Multi-Component Multi-State Reliability Systems, June 1, 1984 to May 31, 1989. AFOSR, Co-Principal Investigator with Professor G.S. Fishman and Professor J.S. Provan.

Modeling Techniques for Commercial Fault Tolerant Systems, April 1, 1984 to March 31, 1986, Duke University (Sponsor) IBM, Principal Investigator.

Research Work listed according to main topics.

Area 1: Performance Evaluation of Computer Systems.

(1986) On modeling the performance and reliability of multimode computer systems, with K.S. Trivedi and V.F. Nicola. *Journal of Systems and Software*, **6**, 175-182.

(1987) Queueing analysis of a fault tolerant computer system, with V.F. Nicola and K.S. Trivedi, *IEEE Trans. on Software Engineering*, Vol. SE13, No. **3**, 363-375.

(1986) Numerical Evaluation of performability and job completion time in repairable fault-tolerant systems, with V.F. Nicola, K.S. Trivedi and R.M. Smith. *Proceedings of the 16th IEEE International Symposium on Fault Tolerant Computing*, Vienna, Austria, 252-257.

(1987) The completion time of a job on multimode systems, with K.S. Trivedi and V.F. Nicola, *Advances in Applied Probability*, **19**, 932-954.

- (1990) Effects of checkpointing and queueing on program performance, with K.S. Trivedi and V.G. Nicola, *Stochastic Models*, **6**, 615-648.
- (1992) Optimal scheduling of exponential tasks withintree precedence constraints on two parallel processors subject to failure and repair, with P.F. Chimento, *Operations Research*, **40**, Supplement 2, S263-S271.
- (1993) Transient analysis of deterministic and stochastic petri nets, with H. Choi and K.S. Trivedi, *14th International Conf. on Appli. and Theory of Petri Nets, Lecture Notes in Computer Science*, 166-185, Chicago.
- (1993) Markov regenerative stochastic Petri Nets, with H. Choi and K.S. Trivedi, *PERFORMANCE 93*, International Sym. on Comp. Perf. Modeling, Measurement and Evaluation, 339-356.
- (1993) FSPNs: Fluid Stochastic Petri Nets, with K. S. Trivedi, *Proceedings of the 14th International Conference on Application and theory of Petri Nets, Lecture Notes in Computer Science*, 24-31.
- (1994) Numerical computation of response time distributions using stochastic reward nets, with J. K. Muppala, K. S. Trivedi and V. Mainkar, *Annals of Operations Research*, **48**, 155-184.
- (1994) A reader-writer queue with reader preference, with L.C. Puryear, *QUESTA*, **15**, 81-97.
- (1995) A reader-writer queue with alternating exhaustive priorities, with L.C.Puryear, *QUESTA*, **19**, 81-103.
- (1997) Stability and queueing-time analysis of a reader-writer queue with writer preference, with L.C. Puryear, *Interfaces in Computer Science and Operations Research: Advances in Metaheuristics, Optimization, and Stochastic Modeling Technologies*, eds: Richard S. Barr, Richard V. Helgason, Jeffery L. Kennington, Kluwer, 259-279.
- (1997) Comparison of stability and queueing times in reader-writer queues, with L. C. Puryear, *Journal of Performance Modeling*, **30**, 195-215.

- (1998) Optimal Scheduling of Reader-Writer Systems, with K. D. Glazebrook and L.C. Puryear, *Naval Research Quarterly*, **45**, 483-495.
- (1999) Optimal Admission to Reader-Writer Systems with no Queuing, with T. Sanli, *Operations Research Letters*, **25**, 213-218.
- (2000) Partial Loss in Reward Models, with A. Bobbio and M. Telek, *2nd Int. Conf. on Mathematical Methods in Reliability*, Bordeaux, France, 207-210.
- (2001) Blocking Analysis of Transaction Processing Queues, with T. Sanli, *Performance Evaluation*, **46**, 235-254.

Area 2: Communication Systems.

- (1990) Optimal control of two infinite server queues, with R. Hariharan and S. Stidham, *Proceedings of the 29th IEEE Conference on Decision and Control*, Hawaii, 1329-1335.
- (1992) A queueing network model for half-duplex routing in data-communication networks, with S.S. Stidham, *High-Speed Communication Networks*, Ed. H. Perros, Plenum Press, New York.
- (1994) Bandwidth allocation and access control in high speed networks, with L. Gün and A. Narayanan, *Annals of Operations Research*, **49**, 161-183.
- (1994) Fluid model driven by an Ornstein-Uhlenbeck process, with T. Rolski, *Probability in Engineering and Informational sciences*, **8**, 403-417.
- (1994) Second-order fluid flow models: reflected Brownian motion in random environment, with R.L. Karandikar, *Operations Research*, **43**, 77-88.
- (1994) Effective bandwidth vector for two-priority ATM traffic, with L. Gün, P. Chimento, *Proceedings of the INFOCOM'94*, 1056-1063.

- (1995) Effective bandwidth vectors for multiclass traffic multiplexed in a partitioned buffer, with P. F. Chimento and L. Gün, Special Issue on Advances in the Fundamentals of Networking , *IEEE Journal on Selected Areas in Communications*, **13**, 1039-1047.
- (1995) Optimal flow control of a stochastic fluid flow system, with S. Rajagopal and S. Stidham, Jr., Special Issue on Advances in the Fundamentals of Networking , *IEEE Journal on Selected Areas in Communications*, **13**, 1219-1228.
- (1996) Effective bandwidth for Markov regenerative sources, *QUESTA* **24**, 137-154.
- (1996) First Passage Times in Fluid Models With An Application to Two Priority Fluid Systems, with A. Narayanan, *Proceedings of IPDS'96*.
- (1996) Leaky Buckets: Sizing and Admission Control, with N. Gautam, 785-790, *Proceedings of the 35th IEEE Conference on Decision and Control*, Kobe, Japan.
- (1997) Fluid models for single buffer systems, *Frontiers in Queueing: Models and Applications in Science and Engineering*, 321-338, Ed. J. H. Dshalalow, CRC Press.
- (1998) Fluid Stochastic Petri Nets: Theory, Applications and Solutions, with G. Horton, D.M.Nicol, and K.S. Trivedi, *EJOR*,**105**, 184-201.
- (1997) Optimal Flow Control of a Multi-Class Stochastic Fluid Flow System, with S. Rajagopal, and S. Stidham, to appear *IEEE Transactions on Automatic Control*.
- (1997) Admission Control of multi-class traffic with service priorities in high-speed networks, with N. Gautam, *QUESTA*, **27**, 79-97.
- (1998) Optimal Admission Control of Markov-Modulated Batch Arrivals to a Finite Capacity Buffer, with T. E. Tedijanto, *Stochastic Models*, **14**, 95-122.

- (1999) Bounds for fluid models driven by semi-Markov inputs, with N. Gautam, Z. Palmowski, and T. Rolski. *PEIS*, **13**, No. 4, 429-475.
- (2000) Applications of SMP Bounds to Multi-Class Traffic in High-Speed Networks, with N. Gautam, *QUESTA*, **36**, No. 4, 351-380.
- (2002) Mean First Passage Times in Fluid Queues, with E. Tzenova, *OR Letters*, **30**, 308-318.
- (2002) An Upper Bound on the Overflow Probability in Transient Source System, *Advances in Performance Analysis*, **3**, 179-206.
- (2002) Output Analysis of Multi-Class Fluid Queues: FCFS Service, with K. D. Glazebrook, *Journal of Applied Probability*, **39**, 341-358.
- (2003) Stochastic Discretization for Long-run Average Reward in Fluid Models, with I. Adan, *PEIS*, **17**, 251-265.
- (2003) Stochastic Differential Equation for TCP Window Size: Analysis and Experimental Validation, with A. Budhiraja, F. Hernández-Campos, and F. D. Smith, *PEIS*, **17**, No. 2, 251-265.
- (2003) Single-Server Queue with Markov-Dependent Inter-arrival and Service Times, with I. Adan, *QUESTA*, **45**, No. 2, 113-134.
- (2003) Fluid Models with Jumps, with I. Adan and E. Tzenova, under revision for *Stochastic Models*.

Area 3: Business Operations Models.

- (2001) A Non-renewable Minimal Repair Warranty Policy With Time Dependent Costs, with Shau-shiang Ja, Amit Mitra, and Jayprakash Patankar, *IEEE Transactions on Reliability* **50**, No. 4, 346-352.
- (2002) Warranty Reserves for Non-stationary Sales Processes, with Shau-shiang Ja, Amit Mitra, and Jayprakash Patankar, *NRLQ*, **49**, No. 5, 499-513.
- (2002) Computation of Warranty Reserves with General Sales Processes, with Shau-Shiang Ja, to appear in ???.

(2003) Optimal EOQ for Announced Price Increases in Infinite Horizon, with Wei Huang, and Jayashankar M. Swaminathan, *Operations Research*, **51**, No. 2, 331-336.

(2003) Outsourcing Warranty Repairs: Static Allocation, with M. Opp and J. Swaminathan, submitted to Transactions of the IIE.

(2003) Outsourcing Warranty Repairs: Dynamic Allocation, with M. Opp and K. Glazebrook, Submitted to NRLQ.

Area 4: Stochastic Processes: Theory.

(1983) A fluctuation theory for Markov chains, with N.U. Prabhu, *Stochastic Processes and Their Applications*, **16**, 39-54.

(1985) Limiting distributions of functionals of Markov chains, with R.L. Karandikar, *Stochastic Processes and Their Applications*, **19**, 225-235.

(1986) Some limit theorems for cumulative processes with applications to sojourn times, *Operations Research Letters*, **6**, 83-90.

(1989) A new class of multivariate phase type distributions, *Operations Research*, **37**, 151-158.

(1990) Convergence of moments of Markov chains and semiMarkov processes, with R.L. Karandikar, *Probability, Statistics and Design of Experiments*, R.R. Bahadiny (eds), Wiley Eastern, New Delhi, 453-460.

(1995) Optimal implementable policies : discounted cost case, with Y. Serin, *Computations with Markov Chains*, 283-307, ed: W. Stewart; Kluwer Academic Publications.

(1997) Introduction to Technical Articles, (Guest Editor) *QUESTA*, **24**, 19-22.

(2000) Discrete Time Markov Chains, Section 7.7 in *CRC Handbook on Discrete and Combinatorial Mathematics*, CRC Press.

(2000) Queueing theory, Section 7.8 in *CRC Handbook on Discrete and Combinatorial Mathematics*, CRC Press.

Area 5: Queueing Systems with Retrials.

- (1983) On queueing systems with retrials, *Journal of Applied Probability*, **20**, 380-389.
- (1983) A game theoretical model for two types of customers competing for service, *Operations Research Letters*, **2**, 119-122.
- (1986) Expected waiting times in multiclass batch arrival retrial queues, *Journal of Applied Probability*, **23**, 144-154.
- (1986) Deterministic retrial times are optimal in queues with forbidden states, with S.P. Sethi, *INFOR*, **27**, 374-386.
- (1989) Optimal retrial policies for restrained Markov chains, *Stochastic Models*, **5**, 401-429.
- (1990) Retrial queues with server subject to breakdowns and repairs, with B.D. Choi, *Queueing Systems*, **7**, 191-208.
- (1992) Feedback retrial queueing systems, with B.D. Choi, *Queueing and Related Models*, Chapter 5, 93-105. U.N. Bhat and I.V. Balawa (eds.), Oxford University Press.
- (1993) Monotonicity properties of retrial queues, with H.M. Liang, *Stochastic Models*, **9**, 373-400.
- (1993) Stability condition for a single server retrial queue, with H.M. Liang, *Advances in Applied Probability*, **25**, 690-701.
- (1997) Retrial queues revisited, with H. M. Liang, *Frontiers in Queueing: Models and Applications in Science and Engineering*, 19-34, Ed. J. H. Dshalalow, CRC Press, 19-34.
- (1999) Optimal Control of Retrial Queues, with H. M. Liang, *Applied Probability and Stochastic Process*, Eds: J. G. Shanthikumar and U. Sumita, 203-219.

Area 6: Reliability and Stochastic Networks.

- (1984) A compact hash function for paths in PERT networks, *Operations Research Letters*, **3**, 137-140.
- (1985) An improved implementation of Monte Carlo estimation of path lengths in stochastic networks, with J.S. Provan, *Operations Research*, **33**, 1389-1393.
- (1985) Maximum flow in networks with exponentially distributed arc capacities, with V.G. Adlakha, *Stochastic Models*, **1**, 263-290.
- (1986) A recursive algorithm for the exact computation of network reliability, with M. Bailey, *IEEE Trans. on Reliability*, Vol. R35, No. **1**, 36-40.
- (1986) Markov and Markov regenerative PERT networks, with V.G. Adlakha, *Operations Research*, **34**, 769-781.
- (1986) Shortest paths in networks with exponentially distributed arc lengths, *Networks*, **16**, 255-274.
- (1987) Minimal spanning trees in undirected networks with exponentially distributed arc weights, *Networks*, **18**, 111-124.
- (1989) Exact cuts in networks, with J.S. Provan, *Networks*, **19**, 281-289.
- (1989) A classified bibliography of research on stochastic PERT network, with V. G. Adlakha, *INFOR*, **27**, 273-290.
- (1990) Minimum cost routing on stochastic networks, with G.A. Corea, *Operations Research*, **38**, 527-537.
- (1990) Generating random combinatorial objects, *Journal of Algorithms*, **11**, 185-207.
- (1992) Improving Monte Carlo efficiency by increasing variance, with G.S. Fishman, *Management Science*, **38**, 1432-1444.

Area 7: Ranking and Selection.

(1986) Optimal and suboptimal procedures for selecting the best of two Bernoulli populations, with R.V. Kulkarni, *Journal of Statistical Planning and Inference*, **15**, 311-330.

Unpublished Technical Reports:

(1979) Probabilistic models for public transportation systems, TR 438, School of ORIE, Cornell University.

(1980) Ladder processes for Markov and semi-Markov chains, Technical Report No. 483, (dissertation).

(1990) A survey of research relevant to virtual-circuit routing in telecommunication networks, with R. Hariharan and S. Stidham, Jr. Technical Report UNC/OR/TR/90-13, Department of Operations Research, University of North Carolina, Chapel Hill, NC.

(1993) Fluid model driven by a multidimensional Ornstein-Uhlenbeck process, with T. Rolski, Technical Report No. UNC/OR/TR/93-7, Department of Operations Research, University of North Carolina, Chapel Hill, NC.

Other professional experience and activities, with dates:

Service to OR Community

1. Editorial Board Member, *Stochastic Models*, 1988 - 1997.
2. Associate Editor, *Operations Research Letters*, 1989-1995.
3. Guest Editor, Special Issue of *QUESTA* in honor of Prof. N. U. Prabhu, 1996.
4. Council Member, Applied Probability Group within ORSA/TIMS, 1991 - 1992.
5. Chairman Elect, Applied Probability Group within ORSA/TIMS, 1992 - 1993.

6. Chairman, Applied Probability Group within ORSA/TIMS, 1993 - 1994.
7. Refereed articles for OR related journals.

Invited Talks:

1. (1984) Shortest paths in stochastic networks, N.C. State University.
2. (1987) Minimum cost transshipment on stochastic networks, IFORS Conference, Argentina.
3. (1987) Generating random spanning trees, ORSA Conference, St. Louis.
4. (1988) Effect of checkpointing on program performance, ORSA Conference, Washington DC.
5. (1988) Deterministic retrial times are optimal, ORSA Conference, Denver.
6. (1989) Implementable policies, ORSA Conference
7. (1990) Monotonicity properties of retrial queues, Applied Probability Conference, Monterey, CA.
8. (1991) A second-order fluid flow model of a buffer in random environment, Columbia University, NY, NY.
9. (1992) A second-order fluid flow model of a buffer in random environment, Bell Labs, Murray Hill, NJ.
10. (1993) A reader-writer queue with alternating exhaustive priorities, ORSA Conference, Chicago, IL
11. (1993) Markov regenerative petri nets, Applied Probability Group Meeting, Paris, France.
12. (1993) Markov Regenerative stochastic Petri Nets, Invited lecture at University of Leiden, The Netherlands.
13. (1995) Effective bandwidth for Markov regenerative sources, Applied Probability Group Conference, Atlanta, GA.

14. (1996) Reader-Writer Queues with Writer Preference, *Computer Science and Operations Research: Recent Advances in the Interface*, Dallas, Texas.
15. (1996) Optimal Scheduling for Reader-Writer Systems, INFORMS Conference, Washington, D.C.
16. (1996) Admission Control In Communication Networks, Univ. of Penn., Philadelphia, PA.
17. (1996) Reader-Writer Queues, National Central University, Taiwan, ROC.
18. (1996) Reader-Writer Queues, Taejon, Republic of Korea.
19. (1998) Second Order Fluid Models, Budapest, Hungary.
20. (1998) Second Order Fluid Models, Wroclaw, Poland.
21. (1998) Second Order Fluid Models, Eindhoven, The Netherlands.
22. (1999) Warranty Reserve Calculations, Pennsylvania State University, College Station, PA.
23. (1999) Warranty Reserve Calculations, NCSU, Raleigh, NC.
24. (2000) Second Order Fluid Models, Dept of Statistics, University of North Carolina, NC.
25. (2000) Fluid Queues: A Tutorial. EURANDOM, Eindhoven, The Netherlands.
26. (2001) IQTEST: Integrated Quality and Throughput Evaluation and Simulation Tool, Inyong Ham Distinguished lecture, Industrial and Manufacturing Engineering, Penn State, PA.

Contributed Papers at Conferences:

1. (1980) Probabilistic models for transportation systems, ORSA Conference, Washington, DC. Received honorable mention in the Nicholson Student Paper Competition held by ORSA in 1980.

2. (1981) Ladder processes for Markov chains, ORSA Conference, Montreal.
3. (1982) A queueing system with retrials, ORSA Conference, Detroit.
4. (1983) Optimal revisits to Markov chains, 13th International Conference on Stochastic Processes, Cornell University, Ithaca.
5. (1984) Expected waiting times in a $M(X1), M(X2)/G1, G2/1/1$ retrial queue, ORSA Conference, San Francisco.
6. (1984) A recursive algorithm for network reliability, ORSA Conference, Dallas. (Presented by M.P. Bailey).
7. (1984) Maximum flow in stochastic networks, ORSA Conference, Dallas.
8. (1985) Shortest paths in stochastic networks, Third Biennial Conference of Applied Probability Group of ORSA/TIMS.
9. (1985) On modeling the performance and reliability of multimode computer systems, ORSA Conference, Boston.
10. (1985) Maximum flow in stochastic networks, AFOSR Conference on Reliability, Luray.
11. (1985) Markov and Markov regenerative PERT networks, ORSA Conference, Atlanta.
12. (1986) A new class of multivariate phase type distributions, ORSA Conference, Los Angeles.
13. (1986) Queueing analysis of fault tolerant computer systems, Performance 86, Raleigh. (Presented by V.F. Nicola).
14. (1986) Minimum spanning trees in stochastic networks, ORSA Conference, Miami Beach.
15. (1987) Queueing analysis of fault tolerant computer systems, Fourth Biennial Conference of the Applied Probability Group.

16. (1987) Minimum cost routing on stochastic networks, ORSA Conference, New Orleans. (Presented by G. Corea).
17. (1988) Shortest paths in stochastic networks with discrete arc lengths, ORSA Conference, Washington, DC. (Presented by G. Corea).
18. (1989) Criticality indices of paths in networks with random arc lengths having discrete distributions, ORSA Conference, Denver. (Presented by G. Corea).
19. (1990) Dynamic control of retrial queues, ORSA Conference, Philadelphia, PA. (presented by H.M. Liang).
20. (1991) Dynamic control of two infinite server queues, ORSA Conference, Nashville, TN (presented by R. Hariharan).
21. (1991) Stability condition for single server retrial queue, ORSA Conference, Anaheim, CA (presented by H.M. Liang).
22. (1991) Optimal bandwidth allocation using leaky buckets, Telecommunications Conference, Boca Raton, FL.
23. (1992) A queueing model for database systems, ORSA Conference, Orlando, FL (presented by L.C. Puryear).
24. (1993) Markov Regenerative stochastic Petri Nets, Appl. Prob. Conf., Paris.
25. (1993) Optimal control of input rate to a buffer, ORSA Conference, Phoenix , Arizona (presented by S. Rajagopal).
26. (1993) Performance and reliability analysis using Markov regenerative Petri Nets, ORSA Conference, Phoenix , Arizona.
27. (1993) Models of variable bit rate sources in high-speed networks, ORSA Conference, Phoenix , Arizona (presented by P. Chimento).
28. (1993) Steady-state analysis of a queue with server subject to breakdowns and repairs, ORSA Conference, Phoenix , Arizona (presented by A. Narayanan).

29. (1994) Steady-state analysis of a static priority multiclass fluid queue, ORSA Conference, Boston, MA (presented by A. Narayanan).
30. (1994) Optimal admission control of a multi-priority stochastic fluid-flow system, ORSA Conference, Boston, MA (presented by S. Rajagopal).
31. (1994) Optimal paging and prefetching for memory management, ORSA Conference, Boston, MA (presented by S. Janakiram).
32. (1995) Effective bandwidth vectors for multi-class traffic multiplexed onto a single buffer, Telecom SIG conference, Boca Raton, FL.
33. (1995) Comparison of stability and queueing times for reader-writer queues, INFORMS Conference, New Orleans, LA. (presented by L.C. Puryear).
34. (1996) Admission Control of multi-class traffic with service priorities in high-speed networks, INFORMS Conference, Washington, DC, (presented by N. Gautam).
35. (1996) Leaky Buckets: Sizing and Admission Control, 35th IEEE conference on Decision and Control, Kobe, Japan, (presented by N. Gautam).
36. (1996) Admission Control Strategies for the Transient Source Systems, INFORMS, Washington, DC, (presented by T. Reid).
37. (1996) Leaky Buckets: Sizing and Admission Control, INFORMS, Washington, DC, (presented by N. Gautam).
38. (1997) Bounds for fluid models driven by semi-Markov inputs, Applied Probability Conference, Boston.
39. (1998) Bounds for Overflow Probabilities for transient Source Systems, INFORMS Seattle.
40. (1998) Admission Control of Multi-Priority Traffic, Telecom SIG Conference, Boca Raton, Florida.

41. (1998) Computations of Warranty Reserves for Non-stationary Sales Processes, INFORMS, Montreal.
42. (1998) Performance Evaluation of Partitioned Databases, INFORMS, Montreal.
43. (1999) WARE: Warranty Reserve Computation Software, INFORMS, Cincinnati.
44. (1999) Optimal Admission Control for Single Buffer Markovian Systems, INFORMS Philadelphia.
45. (2000) Integrated Testing in Manufacturing, INFORMS Austin-Texas.
46. (2002) Output Analysis of Multi-Class Fluid Queues: FCFS Service, INFORMS TELECOM Group Meeting, Boca Raton, Florida.
47. (2003) Funding a Warranty Reserve After Each Sale and Fiscal Period, INFORMS Conference, Atlanta, GA.
48. (2003) Outsourcing Warranty Repairs: Dynamic Routing, INFORMS Conference, Atlanta, GA.
49. (2003) Warranty Outsourcing Among Competing Vendors, INFORMS Conference, Atlanta, GA.
50. (2004) Fluid models with jumps, 29th Conference on Mathematics of Operations Research, Lunterean, The Netherlands.
51. (2004) Managing warranty reserves, 29th Conference on Mathematics of Operations Research, Lunterean, The Netherlands.
52. (2004) Managing Warranty Reserves, University of Michigan, Ann Arbor, Dept of IE.

Conferences Organized:

Fifth Biennial Conference of the Applied Probability Group held in Chapel Hill in May 1989.

Cluster chairman for the Applied Probability Cluster, ORSA Conference, Orlando, April 1992.

STUDENT SUPERVISION:

Masters Students

Advisor

1. Huang, Wei (2002). Single-Warehouse, Multiple-Retailer Supply Chains.
2. Ja, Shau-Shiang (1997). Cost Analysis of Industrial Warranties.
3. Huang, Sheng (1996). Channel Assignment Algorithms for Cellular Networks.
4. Natarajan, Gautam (1995). Effective bandwidth methodologies for network management.
5. Narayanan, Anupama (1991). Monotonicity properties of polling systems.
6. Niederberger, James (1990). The optimal mix of bus sizes and trippers for the Chapel Hill Transit System.
7. Nanda, Sanjay, (1990). Facilities, Layout, storage and inventory control of job materials at the UNCCH Physical Plant.
8. Cookson, Madeline P. (1990). Recommendations for recycling of multifamily residential waste.
9. Desai, Sunil S. (1989). Alternatives to the Reel Tape System: A comparative study for the Academic Computing Services at the University of North Carolina at Chapel Hill.
10. Desai, Subhash (1989). Efficient classroom utilization on the campus of the University of North Carolina at Chapel Hill.
11. Murrell, James A. (1988). Stochastic learning automata in adaptive control systems.

12. Bailey, Michael (1985). Use of Markov chains in exact computation of network reliability.
13. Hu, YuhJong (1984). Networks of queues: theory and applications.
14. Facci, Joanne (1982). Optimal stopping of Markov chains: theory and applications.
15. Randall, Jr., Myron W. (1981). Markov manpower planning models.

Doctoral Students

1. Peter Buczowski. (2004) Managing Warranties: Funding a Warranty Reserve and Outsourcing Prioritized Warranty Repairs.
2. Michelle Opp. (2003) Outsourcing Warranty Repair Services: Static and Dynamic Allocation for a Fixed Population.
3. Tzenova, Elena. (2003) An Analytic Approach to Multi-Class Stochastic Fluid Models with Static Priorities.
4. Hirasawa, Yasutaka. (2000) Approximating Traffic Parameters in Multi-Class Fluid Networks.
5. Sanli, Tugrul. (1999) Stochastic Models for Partitioned Databases.
6. Ja, Shau-Shiang (1998) Warranty Models for Industrial Products.
7. Reid, T. (1997) Call admission of transient sources in high-speed networks.
8. Gautam, N. (1997) Admission control of multi-class traffic in high-speed networks.
9. Puryear, L. (1995). Priority schemes for reader writer queues.
10. Janakiram, S. (1995). Optimal memory management policies. (Joint advisor with S. Stidham)
11. Rajagopal, S. (1994). Optimal control of fluid systems. (Joint advisor with S. Stidham)

12. Narayanan, Anupama, (1993). Stochastic fluid flow models for polling systems and multiclass queues.
13. Liang, Huei-Mei (1991). Retrial queues.
14. Corea, Gehan, A. (1989). Recursive methods and bounds for performance evaluation of stochastic networks.
15. Serin, Yasemin (1989). Implementable policies for Markov decision processes.
16. Bailey, Michael (1988). Stochastic combinatorial optimization: continuous time Markov chain techniques.
17. Cohen, Marc D. (1987). A methodology for the analysis of Fishery Management Policies, with an example of the North Carolina Brown Shrimp Fishery.