

## CURRICULUM VITAE

**Vidyadhar G. Kulkarni**

Department of Statistics and Operations Research  
University of North Carolina  
Chapel Hill, NC 27599-3180  
Updated: Oct 2015.

### **Personal:**

Office Phone: (919)962 3837

Email: vkulkarn@email.unc.edu

Webpage: [www.unc.edu/~vkulkarn](http://www.unc.edu/~vkulkarn)

### **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.

### **Previous Positions:**

**Professor**, Department of Statistics and Operations Research, 2003-.

**Professor and Chair**, Department of Statistics and Operations Research, 2003-2009.

**Professor and Chair**, Department of Operations Research, 2000-2003.

**Professor**, Department of Operations Research, 1993 - 2003.

**Associate Professor**, Department of Operations Research, 1989 - 1993.

**Assistant Professor**, Department of Operations Research, 1981 - 1988.

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

**Honors:**

**Norman L. Johnson Professorship.** Term chair, 1997 - 2002, 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.)

**Bibliography:**

**Books:**

**Graduate Textbook:** (First Edition 1995, Second Edition 2010, Third Edition in preparation)

*Modeling and Analysis of Stochastic Systems, 2nd Edition*,  
CRC Press, London, ~ 550pp.

**Undergraduate Textbook:** (First Edition 1999, Second Edition 2010)  
*Introduction to Modeling and Analysis Stochastic Systems, 2nd Edition*,  
Springer, New York, ~ 350pp.

**Book Chapters:**

1. (2006) Admission Control in the Presence of Priorities: a Sample Path Approach, with F. Chen, *Stochastic Processes, Optimization, and Control Theory: Applications in Financial Engineering, Queueing Networks, and Manufacturing Systems: A Volume in Honor of Suresh Sethi*, International Series in Operations Research and Management Science, Vol. 94, H. Yan, G. Yin, and Q. Zhang (Eds.), Springer.
2. (2000) Discrete Time Markov Chains, Section 7.7 in *CRC Handbook on Discrete and Combinatorial Mathematics*, CRC Press.
3. (2000) Queueing theory, Section 7.8 in *CRC Handbook on Discrete and Combinatorial Mathematics*, CRC Press.

4. (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.
5. (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.
6. (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.

#### **Educational Software:**

*MAXIM: A collection of MATLAB m-files to accompany the undergraduate textbook,*

*MAXIMGUI: A graphical user interface to access MAXIM. (1999)*

Available for free download on

<ftp://ftp.mathworks.com/pub/books/kulkarni/MAXIM.zip>

<ftp://ftp.mathworks.com/pub/books/kulkarni/MAXIMGUI.zip>

#### **Articles Submitted and in Preparation:**

1. (2017) A Stochastic Model of Order Book Dynamics using Bouncing Geometric Brownian Motions, with Q. Gong and X. liu, Under preparation.
2. (2017) Appointment Scheduling for Returning Customers, with S. Yu and V. Deshpande, Submitted to POMS.
3. (2017) Using Statistical Forecasting and Queueing Models to Manage Virtual Computer Labs, with S. Yu and H.shen, under preparation.
4. (2017) Optimal Routing of Customers in a Two-Station Polling System, with I. Adan, under revision for QUESTA.

#### **Refereed Articles:**

1. (2017) Automated Teller Machines Replenishment Policies With Sub-modular Costs, with Y. Zhang, to appear in *MSOM*.

2. (2017) H3K36 Methylation Regulates Nutrient Stress Response in *Saccharomyces cerevisiae* by Enforcing Transcriptional Fidelity, Stephen L. McDaniel1, Austin Hepperla, Jie Huang, Raghuvar Dronamraju, Alexander Adams, Vidyadhar G. Kulkarni, Ian J. Davis1 and Brian D. Strahl; *Cell Reports*, 19, 2371-2382.
3. (2017) Optimal Control of a Single Server in a Finite Population Queueing Network, with Deng Chao and Nilay Argon, *Queueing Systems*, 85, 149172.
4. (2017) Two-day appointment scheduling with patient preferences and geometric arrivals, *QUESTA*, 85, 173209, with Yu Zhang.
5. (2016) The Snowball Effect of Customer Slowdown in Critical Many-server Systems, with J. Selen, I. Adan, and J. Leeuwaarden, accepted for publication in *Stochastic Models*, arXiv:1502.02856.
6. (2016) Self-selecting priority Queues with Burr Distributed Waiting Costs, with S. Gavirneni, to appear in *POMS*, **25**, No.3.
7. (2016) The diffusion Model for a Double-ended Queue with Renewal Arrival Processes, with Q. Gong and X. liu, *Stochastic Systems*, **5**, No. 1, 1-61. (arXiv:1401.5146.)
8. (2015) A Tandem Queueing Model for an Appointment-based Service System, with J. Luo and S. Ziya, *QUESTA*, **79**, 53-85.
9. (2014) Concierge Medicine: Applying Rational Economics to Health Care Queueing, with S. Gavirneni. *Cornell Hospitality Quarterly*, No. 55, 314-325.
10. (2014) Optimal Arrival and Service Rate Control of Multi-Server Queues, with Nelson Lee, *QUESTA*, 37-50.
11. (2014) Optimal Static Assignment and Routing Policies for Service Centers with Correlated Traffic, with N. Lee, Y. Hirasawa, *PEIS*, No 28, 279-311.
12. (2013) The Shorter Queue Polling Model, with I. Adan, O. Boxma, and S. Kapodistria and I. Adan, *Annals of Operations Research*, 1-34.

13. (2013) Optimal Control of a Server Farm, with Ivo Adan and Sandra van Wijk, *INFOR*, 51, 241-252.
14. (2012) Production-Inventory Systems in Stochastic Environment and Stochastic Lead Times, with K. Yan. *QUESTA*, **70**, No. 3, 207-231.
15. (2012) Appointment Scheduling under Patient No-Shows and Service Interruptions, with J. Luo and S. Ziya, *MSOM*, no. 14, 67-684.
16. (2010) Dynamic Scheduling of Outpatient Appointments under Patient No-shows and Cancelations, with N. Liu and S. Ziya, *Manufacturing and Service Operations Management*, **12**, No. 2, 347-364.
17. (2009) Index Policies for Resource Allocation in Wireless Networks, with N. Bolia, *IEEE Transactions on Vehicular Technology*, **58**, No. 4, 1823-1835.
18. (2009) Decomposition Property for Markov-modulated Queues with Applications to Warranty Management, with Nan Liu, *Probability in Engineering and Informational Sciences*. **23**, No. 3, 433-447.
19. (2008) Dynamic Routing of Prioritized Warranty Repairs, with F. Chen, *NRLQ*, No. 55, 1626.
20. (2008) Managing the Inventory of an Item with a Replacement Warranty *Management Science*, with Wei Huang, and Jayashankar M. Swaminathan, 54, 1441 - 1452.
21. (2008) Optimal Inventory Policies Under Stochastic Production and Demand Rates, with K. Yan, *Stochastic Models*, **24**, No. 2, 173-190.
22. (2008) Insurance Risk with Variable Number of Policies, with Ivo Adan, *Probability in the Engineering and Informational Sciences*, **22**, 213-219.
23. (2008) Warranty Claims Modeling, with S. Resnick, *Naval Research Logistic Quarterly*, **55**, No. 4, 339-349.
24. (2008) Output analysis of multi-class fluid models with static priorities, with E. Tzenova and I. Adan, *Performance Evaluation*, **65**, 7181.

25. (2008) Optimal Inventory Policies under Stochastic Production and Demand Rates, with K. Yan, *Stochastic Models*, Vol. 24, No. 2.
26. (2007) Coordinated Inventory Planning for New and Old Products Under Warranty, *Probability in the Engineering and Informational Sciences*, with Wei Huang, and Jayashankar M. Swaminathan, 21, 261-287.
27. (2007) A fluid model with upward jumps at the boundary, with K. Yan, *Queueing Systems*, 56, 103-117.
28. (2006) Funding a Warranty Reserve with Contributions After Each Sale, with P. Buczkowski, *Probability in the Engineering and Informational Sciences*, Volume 20(3), 497-515.
29. (2006) Explicit Solutions for the Steady State Distributions in  $M/PH/1$  Queues with Workload Dependent Balking, with L. Liu, *QUESTA*, Vol. 52, No. 4, 251-260.
30. (2005) Markov Decision Processes under Observability Constraints, with Yasemin Serin, *Mathematical Methods of Operations Research*, **61**, 311-328.
31. (2005) Outsourcing Warranty Repairs: Dynamic Allocation, with M. Opp and K. Glazebrook, *NRLQ*, **52**, No. 5, 381-398.
32. (2005) Outsourcing Prioritized Warranty Repairs, with P. Buczkowski and M. Hartmann, *International Journal of Quality and Reliability Management*, Vol. 22 No. 7, pp. 699-714.
33. (2005) Individual, Class-based, and Social Optimal Admission Policies in Two-Priority Queues, with F. Chen, *Stochastic Models*, 23, 1-31.
34. (2005) Fluid Models with Jumps, with I. Adan and E. Tzenova, *Stochastic Models*, **21**, No. 1, 37-55.
35. (2004) Outsourcing Warranty Repairs: Static Allocation, with M. Opp and J. Swaminathan, submitted to *Transactions of the IIE*.

36. (2003) Optimal EOQ for Announced Price Increases in Infinite Horizon, with Wei Huang, and Jayashankar M. Swaminathan, *Operations Research*, **51**, No. 2, 331-336.
37. (2003) Single-Server Queue with Markov-Dependent Inter-arrival and Service Times, with I. Adan, *QUESTA*, **45**, No. 2, 113-134.
38. (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.
39. (2003) Stochastic Discretization for Long-run Average Reward in Fluid Models, with I. Adan, *PEIS*, **17**, 251-265.
40. (2002) Warranty Reserves for Non-stationary Sales Processes, with Shau-shiang Ja, Amit Mitra, and Jayprakash Patankar, *NRLQ*, **49**, No. 5, 499-513.
41. (2002) Output Analysis of Multi-Class Fluid Queues: FCFS Service, with K. D. Glazebrook, *Journal of Applied Probability*, **39**, 341-358.
42. (2002) An Upper Bound on the Overflow Probability in Transient Source System, *Advances in Performance Analysis*, **3**, 179-206.
43. (2002) Mean First Passage Times in Fluid Queues, with E. Tzenova, *OR Letters*, **30**, 308-318.
44. (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.
45. (2001) Blocking Analysis of Transaction Processing Queues, with T. Sanli, *Performance Evaluation*, **46**, 235-254.
46. (2000) Applications of SMP Bounds to Multi-Class Traffic in High-Speed Networks, with N. Gautam, *QUESTA*, **36**, No. 4, 351-380.
47. (2000) Partial Loss in Reward Models, with A. Bobbio and M. Telek, *9th Int. Conf. on Mathematical Methods in Reliability*, Bordeaux, France, 207-210.

48. (1999) Optimal Control of Retrial Queues, with H. M. Liang, *Applied Probability and Stochastic Process*, Eds: J. G. Shanthikumar and U. Sumita, 203-219.
49. (1999) Bounds for fluid models driven by semi-Markov inputs, with N. Gautam, Z. Palmowski, and T. Rolski. *PEIS*, **13**, No. 4, 429-475.
50. (1999) Optimal Admission to Reader-Writer Systems with no Queueing, with T. Sanli, *Operations Research Letters*, **25**, 213-218.
51. (1998) Optimal Admission Control of Markov-Modulated Batch Arrivals to a Finite Capacity Buffer, with T. E. Tedijanto, *Stochastic Models*, **14**, 95-122.
52. (1998) Fluid Stochastic Petri Nets: Theory, Applications and Solutions, with G. Horton, D.M.Nicol, and K.S. Trivedi, *EJOR*, **105**, 184-201.
53. (1998) Optimal Scheduling of Reader-Writer Systems, with K. D. Glazebrook and L.C. Puryear, *Naval Research Quarterly*, **45**, 483-495.
54. (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*.
55. (1997) Admission Control of multi-class traffic with service priorities in high-speed networks, with N. Gautam, *QUESTA*, **27**, 79-97.
56. (1997) Comparison of stability and queueing times in reader-writer queues, with L. C. Puryear, *Journal of Performance Modeling*, **30**, 195-215.
57. (1997) Introduction to Technical Articles, (Guest Editor) *QUESTA*, **24**, 19-22.
58. (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.



59. (1996) Effective bandwidth for Markov regenerative sources, *QUESTA* **24**, 137-154.
60. (1996) First Passage Times in Fluid Models With An Application to Two Priority Fluid Systems, with A. Narayanan, *Proceedings of IPDS'96*.
61. (1996) Leaky Buckets: Sizing and Admission Control, with N. Gautam, 785-790, *Proceedings of the 35th IEEE Conference on Decision and Control*, Kobe, Japan.
62. (1995) Optimal implementable policies : discounted cost case, with Y. Serin, *Computations with Markov Chains*, 283-307, ed: W. Stewart; Kluwer Academic Publications.
63. (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.
64. (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.
65. (1995) A reader-writer queue with alternating exhaustive priorities, with L.C.Puryear, *QUESTA*, **19**, 81-103.
66. (1994) Bandwidth allocation and access control in high speed networks, with L. Gün and A. Narayanan, *Annals of Operations Research*, **49**, 161-183.
67. (1994) Fluid model driven by an Ornstein-Uhlenbeck process, with T. Rolski, *Probability in Engineering and Informational sciences*, **8**, 403-417.
68. (1994) Second-order fluid flow models: reflected Brownian motion in random environment, with R.L. Karandikar, *Operations Research*, **43**, 77-88.

69. (1994) Effective bandwidth vector for two-priority ATM traffic, with L. Gün, P. Chimento, *Proceedings of the INFOCOM'94*, 1056-1063.
70. (1994) A reader-writer queue with reader preference, with L.C. Puryear, *QUESTA*, **15**, 81-97.
71. (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.
72. (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.
73. (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.
74. (1993) Stability condition for a single server retrial queue, with H.M. Liang, *Advances in Applied Probability*, **25**, 690-701.
75. (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.
76. (1993) Monotonicity properties of retrial queues, with H.M. Liang, *Stochastic Models*, **9**, 373-400.
77. (1992) Improving Monte Carlo efficiency by increasing variance, with G.S. Fishman, *Management Science*, **38**, 1432-1444.
78. (1992) Optimal scheduling of exponential tasks with intree precedence constraints on two parallel processors subject to failure and repair, with P.F. Chimento, *Operations Research*, **40**, Supplement 2, S263-S271.
79. (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.

80. (1990) Minimum cost routing on stochastic networks, with G.A. Corea, *Operations Research*, **38**, 527-537.
81. (1990) Generating random combinatorial objects, *Journal of Algorithms*, **11**, 185-207.
82. (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.
83. (1990) Retrial queues with server subject to breakdowns and repairs, with B.D. Choi, *Queueing Systems*, **7**, 191-208.
84. (1990) Effects of checkpointing and queueing on program performance, with K.S. Trivedi and V.G. Nicola, *Stochastic Models*, **6**, 615-648.
85. (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.
86. (1989) Optimal retrial policies for restrained Markov chains, *Stochastic Models*, **5**, 401-429.
87. (1989) A new class of multivariate phase type distributions, *Operations Research*, **37**, 151-158.
88. (1989) Exact cuts in networks, with J.S. Provan, *Networks*, **19**, 281-289.
89. (1989) A classified bibliography of research on stochastic PERT network, with V. G. Adlakha, *INFOR*, **27**, 273-290.
90. (1987) Minimal spanning trees in undirected networks with exponentially distributed arc weights, *Networks*, **18**, 111-124.
91. (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.
92. (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.

93. (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.
94. (1986) A recursive algorithm for the exact computation of network reliability, with M. Bailey, *IEEE Trans. on Reliability*, Vol. R35, No. **1**, 36-40.
95. (1986) Markov and Markov regenerative PERT networks, with V.G. Adlakha, *Operations Research*, **34**, 769-781.
96. (1986) Shortest paths in networks with exponentially distributed arc lengths, *Networks*, **16**, 255-274.
97. (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.
98. (1986) Expected waiting times in multiclass batch arrival retrial queues, *Journal of Applied Probability*, **23**, 144-154.
99. (1986) Deterministic retrial times are optimal in queues with forbidden states, with S.P. Sethi, *INFOR*, **27**, 374-386.
100. (1986) Some limit theorems for cumulative processes with applications to sojourn times, *Operations Research Letters*, **6**, 83-90.
101. (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.
102. (1985) An improved implementation of Monte Carlo estimation of path lengths in stochastic networks, with J.S. Provan, *Operations Research*, **33**, 1389-1393.
103. (1985) Maximum flow in networks with exponentially distributed arc capacities, with V.G. Adlakha, *Stochastic Models*, **1**, 263-290.
104. (1985) Limiting distributions of functionals of Markov chains, with R.L. Karandikar, *Stochastic Processes and Their Applications*, **19**, 225-235.

105. (1984) A compact hash function for paths in PERT networks, *Operations Research Letters*, **3**, 137-140.
106. (1983) On queueing systems with retrials, *Journal of Applied Probability*, **20**, 380-389.
107. (1983) A game theoretical model for two types of customers competing for service, *Operations Research Letters*, **2**, 119-122.
108. (1983) A fluctuation theory for Markov chains, with N.U. Prabhu, *Stochastic Processes and Their Applications*, **16**, 39-54.

**Unpublished Technical Reports:**

1. (1979) Probabilistic models for public transportation systems, TR 438, School of ORIE, Cornell University.
2. (1980) Ladder processes for Markov and semi-Markov chains, Technical Report No. 483, (dissertation).
3. (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.
4. (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.

**Teaching Activities:**

**Courses Taught:**

1. STOR 215: Foundations of Decision Sciences
2. STOR 435: Introduction to Probability
3. STOR 445: Introduction to Stochastic Models

4. STOR 641: Stochastic Models I
5. STOR 642: Stochastic Models II
6. STOR 762: Markov Decision Processes
7. STOR 705: OR Consulting Course
8. STOR 790: Presentations Course
9. STOR 890: Stochastic Models in Market Microstructure
10. STOR 891: Stochastic Models in Healthcare

**Students Supervised:**

**Doctoral Students:**

1. Current Students: Lu Wang (Summer 2018).
2. Siyun Yu (2017). Stochastic Models for Resource Allocation, Series Patient Scheduling and Investment Decisions.
3. Zhang, Yu (2016). Index Policies for Patient Scheduling and ATM Replenishment.
4. Gong, Qi (2014). Three Stochastic Models for Order book Dynamics.
5. Lee, Nelson (2014). Design and Control of Service Centers.
6. Deng, Chao (2013). (Jointly with Prof. Argon)
7. Luo, Jianzhe (2013). Queueing Approaches to Appointment service Design. (Jointly with Prof. Ziya)
8. Bolia, Nimesh (2010). Scheduling Policies in Wireless Cellular Data Networks.
9. Liu, Nan (2009). Appointment Scheduling in Health Care. (Co-advisor: Serhan Ziya).
10. Liu, Liqiang (2007). Queues with workload dependent balking.

11. Yan, Keqi (2006). Fluid Models for Production-Inventory Systems.
12. Chen, Feng (2006). Mathematical Models of TCP Window Size.
13. Huang, Wei (2005). Single-Warehouse, Multiple-Retailer Supply Chains.
14. Peter Buczowski. (2004) Managing Warranties: Funding a Warranty Reserve and Outsourcing Prioritized Warranty Repairs.
15. Michelle Opp. (2003) Outsourcing Warranty Repair Services: Static and Dynamic Allocation for a Fixed Population.
16. Tzenova, Elena. (2003) An Analytic Approach to Multi-Class Stochastic Fluid Models with Static Priorities.
17. Hirasawa, Yasutaka. (2000) Approximating Traffic Parameters in Multi-Class Fluid Networks.
18. Sanli, Tugrul. (1999) Stochastic Models for Partitioned Databases.
19. Ja, Shau-Shiang (1998) Warranty Models for Industrial Products.
20. Reid, T. (1997) Call admission of transient sources in high-speed networks.
21. Gautam, N. (1997) Admission control of multi-class traffic in high-speed networks.
22. Puryear, L. (1995). Priority schemes for reader writer queues.
23. Janakiram, S. (1995). Optimal memory management policies. (Joint advisor with S. Stidham)
24. Rajagopal, S. (1994). Optimal control of fluid systems. (Joint advisor with S. Stidham)
25. Narayanan, Anupama, (1993). Stochastic fluid flow models for polling systems and multiclass queues.
26. Liang, Huei-Mei (1991). Retrial queues.

27. Corea, Gehan, A. (1989). Recursive methods and bounds for performance evaluation of stochastic networks.
28. Serin, Yasemin (1989). Implementable policies for Markov decision processes.
29. Bailey, Michael (1988). Stochastic combinatorial optimization: continuous time Markov chain techniques.
30. Cohen, Marc D. (1987). A methodology for the analysis of Fishery Management Policies, with an example of the North Carolina Brown Shrimp Fishery.

**PhD Student Committees:**

1. (2017) Xi Chen
2. (2015) Huiyin Ooyang
3. (2013) Zhankun Sun, Michael Lamm, Karthik Natarajan, Aaron ratliff

**Masters Students:**

1. Yu, Siyun. (2015).
2. Chen, Jianhong (2015). Optimal Vehicle Routing for Cox Automotive.
3. Pan, Siyun (2015). Evaluating the Effectiveness of Fellowships in Improving the Incoming Class.
4. Tan, Minshi (2015). Excel“at”Carolina Program: Effectiveness and Selection strategy.
5. Sepehr Moravej (2014). Stochastic Decision Models in Optimal Execution.
6. Howard, Philip (2010). Pricing Synthetic CDOs with Markov Processes.
7. He, Ye (2006). Inventory Models with Markov-Modulated Demand.
8. Yan, Keqi (2005). Optimal Ordering Policy: Stochastic Production and Demand Rates.



9. Liu, Liqiang (2005). M/G/1 Queues with work-load dependent balking.
10. Bagani, Nilesh (2005). Co-ordinated dynamic pricing and inventory management.
11. Chen, Feng (2003). Mathematical Models of TCP Window Size.
12. Huang, Wei (2002). Single-Warehouse, Multiple-Retailer Supply Chains.
13. Ja, Shau-Shiang (1997). Cost Analysis of Industrial Warranties.
14. Huang, Sheng (1996). Channel Assignment Algorithms for Cellular Networks.
15. Natarajan, Gautam (1995). Effective bandwidth methodologies for network management.
16. Narayanan, Anupama (1991). Monotonicity properties of polling systems.
17. Niederberger, James (1990). The optimal mix of bus sizes and trippers for the Chapel Hill Transit System.
18. Nanda, Sanjay (1990). Facilities, Layout, storage and inventory control of job materials at the UNCCCH Physical Plant.
19. Cookson, Madeline (1990). Recommendations for recycling of multi-family residential waste.
20. Desai, Sunil (1989). Alternatives to the Reel Tape System: A comparative study for the Academic Computing Services at the University of North Carolina at Chapel Hill.
21. Desai, Subhash (1989). Efficient classroom utilization on the campus of the University of North Carolina at Chapel Hill.
22. Murrell, James (1988). Stochastic learning automata in adaptive control systems.
23. Bailey, Michael (1985). Use of Markov chains in exact computation of network reliability.

24. Hu, YuhJong (1984). Networks of queues: theory and applications.
25. Facci, Joanne (1982). Optimal stopping of Markov chains: theory and applications.
26. Randall, Jr., Myron W. (1981). Markov manpower planning models.

**MS Student Committees:**

1. (2013) Wenbo Zhang, Anna Svirsko, Alp Arslan.

**Undergraduate Students:**

1. Fuhui Wang (2015). Honors Project: Analysis of Bike Sharing Data. (Co-advisor: S. Bhamidi)

**Research Grants:**

1. Outsourcing Warranty and Repair Services, August 15, 2002, Jan 1, 2004, National Science Foundation, Co-Principal Investigator with Professor J. Swaminathan. \$149,820.
2. Quality Management, Sept 1, 2001 to August 31, 2002, IBM, RTP. \$39,425.
3. 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.
4. 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
5. Stochastic Fluid Flow Models for High Speed Networks, July 1, 1991 to August 30, 1992, IBM, Principal Investigator. \$30,874.
6. 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.

7. 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.
8. 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.
9. Modeling Techniques for Commercial Fault Tolerant Systems, April 1, 1984 to March 31, 1986, Duke University (Sponsor) IBM, Principal Investigator.

**Other professional experience and activities, with dates:**

**Service to OR Community**

1. Chairman, Applied Probability Group within ORSA/TIMS, 1993 - 1994.
2. Chairman Elect, Applied Probability Group within ORSA/TIMS, 1992 - 1993.
3. Council Member, Applied Probability Group within ORSA/TIMS, 1991 - 1992.
4. Editorial Board Member, Stochastic Models, 1988 - 1997.
5. Guest Editor, Special Issue of QUESTA in honor of Prof. N. U. Prabhu, 1996.
6. Associate Editor, Operations Research Letters, 1989-1995.
7. Refereed articles for OR related journals.

**Conferences Organized:**

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

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

**Invited Talks:**

1. (2015) Stochastic Models of Appointment Scheduling, Clemson University, October 2015.
2. (2015) Data Driven Decision Making, Universidad de LOS Andes, March 2015.
3. (2015) Stochastic Models in Health Care, Universidad de Los Andes, march 2015.
4. (2015) Stochastic Models of Appointment Scheduling, Koc University, Istanbul, Turkey, July 2015.
5. (2014) Scheduling Series Patients in a Healthcare facility, with Siyun pan, INFORMS, San Francisco.
6. (2014) A Dynamic Programming Model to Assess when it is Optimal to Stop a Trial of Labor, with Karen Hicklin, Julie Ivy, and Evan Myers. Evan Myers, Meera Viswanathan.
7. (2013) Energy Efficient Virtual Appliance Deployment Framework, with N. Lee, Applied Probability Conference, Costa Rica.
8. (2013). Optimization of server Farms, with I. Adan and S. van Wijk, Applied Probability Conference, Costa Rica.
9. (2013). Optimal Routing of Customers in Polling Systems, with I. Adan, N. Lee and Lefebber, Applied Probability Conference, Costa Rica.
10. (2013). Stationary Analysis of the Shortest Queue Polling Model, with I. Adan, O. Boxma, S. Kapoditria, Applied Probability Conference, Costa Rica.
11. (2013) Dynamic Server Assignment in Finite Population Queueing Systems, with N. Argon and C. Deng, INFORMS, Minneapolis.

12. (2013) Bayesian Decision Model for Analyzing Mode of Delivery Considering Mother and Child Outcomes, with J. Ivy, K. Hicklin and M. Viswanathan, INFORMS, Minneapolis.
13. (2013) Admission Policies for Walk-in Patients at a Diagnostic Center, with N. Bolia, INFORMS, Minneapolis.
14. (2013) Appointment Policies with patient Preferences, with Yu Zhang, INFORMS, Minneapolis.
15. (2013) Diffusion Models for double-ended Queues with Renewal Arrival Processes, with X. Liu and Q. Gong, INFORMS, Minneapolis.
16. (2010) Appointment Scheduling with No-Shows and Service Interruptions, with J. Luo and S. Ziya, INFORMS, Austin.
17. (2010) Routing of Correlated Multi-class Traffic, with N. Lee and Y. Hirasawa, INFORMS, Austin.
18. (2009) Dynamic Scheduling of Outpatient Appointments under Patient No-shows and Cancelations, Applied probability Conference, Ithaca, NY.
19. (2004) Fluid models with jumps, 29th Conference on Mathematics of Operations Research, Lunterean, The Netherlands.
20. (2004) Managing warranty reserves, 29th Conference on Mathematics of Operations Research, Lunterean, The Netherlands.
21. (2004) Managing Warranty Reserves, University of Michigan, Ann Arbor, Dept of IE.
22. (2001) IQTEST: Integrated Quality and Throughput Evaluation and Simulation Tool, Inyong Ham Distinguished lecture, Industrial and Manufacturing Engineering, Penn State, PA.
23. (2000) Second Order Fluid Models, Dept of Statistics, University of North Carolina, NC.
24. (2000) Fluid Queues: A Tutorial. EURANDOM, Eindhoven, The Netherlands.

25. (1999) Warranty Reserve Calculations, Pennsylvania State University, College Station, PA.
26. (1999) Warranty Reserve Calculations, NCSU, Raleigh, NC.
27. (1998) Second Order Fluid Models, Budapest, Hungary.
28. (1998) Second Order Fluid Models, Wroclaw, Poland.
29. (1998) Second Order Fluid Models, Eindhoven, The Netherlands.
30. (1996) Reader-Writer Queues, Taejon, Republic of Korea.
31. (1996) Reader-Writer Queues with Writer Preference, *Computer Science and Operations Research: Recent Advances in the Interface*, Dallas, Texas.
32. (1996) Optimal Scheduling for Reader-Writer Systems, INFORMS Conference, Washington, D.C.
33. (1996) Admission Control In Communication Networks, Univ. of Penn., Philadelphia, PA.
34. (1996) Reader-Writer Queues, National Central University, Taiwan, ROC.
35. (1995) Effective bandwidth for Markov regenerative sources, Applied Probability Group Conference, Atlanta, GA.
36. (1993) A reader-writer queue with alternating exhaustive priorities, ORSA Conference, Chicago, IL
37. (1993) Markov regenerative petri nets, Applied Probability Group Meeting, Paris, France.
38. (1993) Markov Regenerative stochastic Petri Nets, Invited lecture at University of Leiden, The Netherlands.
39. (1992) A second-order fluid flow model of a buffer in random environment, Bell Labs, Murray Hill, NJ.

40. (1991) A second-order fluid flow model of a buffer in random environment, Columbia University, NY, NY.
41. (1990) Monotonicity properties of retrial queues, Applied Probability Conference, Monterey, CA.
42. (1989) Implementable policies, ORSA Conference
43. (1988) Effect of checkpointing on program performance, ORSA Conference, Washington DC.
44. (1988) Deterministic retrial times are optimal, ORSA Conference, Denver.
45. (1987) Minimum cost transshipment on stochastic networks, IFORS Conference, Argentina.
46. (1987) Generating random spanning trees, ORSA Conference, St. Louis.
47. (1984) Shortest paths in stochastic networks, N.C. State University.

**Service to the Department/University** Served on numerous committees: admissions, tenure reviews, DGS for INSTORE, search committees, etc.