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CURRICULUM VITAE

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EDUCATION

1968 Ph.D. (Operations Research), Stanford University
1964 M.S. (Operations Research and Computing), Case Institute of Technology
1963 B.A. (Mathematics), Harvard University (*cum laude*)

EXPERIENCE

1986- Professor, Operations Research,
University of North Carolina at Chapel Hill
1990-95 Chair, Department of Operations Research,
University of North Carolina at Chapel Hill
1979-86 Professor, Industrial Engineering and Operations Research,
North Carolina State University
1975-79 Associate Professor, Industrial Engineering and Operations Research,
North Carolina State University
1968-75 Assistant Professor, Operations Research and Environmental Engineering,
Cornell University

Visiting Positions:

2001 Visiting Scholar, Australian National University, Canberra
1991-92 INRIA, Centre Sophia Antipolis, France,
Professeur Invité
1982-83 Statistical Laboratory, University of Cambridge
Overseas Fellow, Churchill College
1981 Bell Laboratories, Holmdel, New Jersey (summer)
1979 Department of Operations Research, Stanford University (summer)
1977 IMSOR, Technical University of Denmark
1975 Department of Operations Research, Stanford University (summer)
1971-72 Institute for Operations Research, Aarhus University, Denmark

TEACHING INTERESTS

I have taught courses in queueing theory, dynamic programming, introductory operations research, probability theory, stochastic processes, scheduling, production, traffic flow, public systems analysis, stochastic models in manufacturing, and stochastic models in finance.

RESEARCH INTERESTS

The main focus of my research has been on optimal design and control and distribution-free analysis of queues, with special emphasis on stochastic networks. I am particularly interested in applications to computer/communication systems, automated and flexible manufacturing systems, design and control of traffic-flow systems, and revenue management in the airline and other service industries.

PROFESSIONAL ACTIVITIES

Member:

Institute for Operations Research and Management Science (INFORMS)
Society for Applied Probability (INFORMS)
Telecommunications Technical Section (INFORMS)

Session Organiser, Invited Speaker

TIMS/ORSA and INFORMS National Meetings
TIMS International Meetings
IEEE Decision and Control Conferences
IFORS Meetings
Conferences on Stochastic Processes and Their Applications
INFORMS Applied Probability Meetings
SIAM Conference on Applied Probability in Science and Engineering

Invited Speaker:

Conference on Mathematical Methods in Queueing Theory, 1973.
Lunteren (Netherlands) Annual Meeting on Operations Research, 1977, 1983.
Conference on Point Processes and Queueing Theory, Keszthely, Hungary, 1978.
Workshop on Point Processes and Queueing Theory, Karpacz, Poland, 1980.
Workshop on Stochastic Differential Systems, University of Minnesota, 1986.
Workshop on Data Networks, MIT, 1987.
Workshop on Networks of Queues, INRIA, France, 1987.
National Meeting on Operations Research, Passau, West Germany, 1987.
Workshop on Discrete Event Dynamic Systems, NSF, 1988.
Workshop on Queueing Theory, Cornell University, 1988.
Conference on Mathematics and Probability, Ajou University, Korea, 1989.
European Statistics Conference, Brussels, Belgium, 1991.
Workshop on Stochastic Models, Oberwolfach, Germany, 1994.
Workshop on Stochastic Models, Leiden University, The Netherlands, 1994.
INFORMS Telecommunications Conference, 1998.
Workshop on Stochastic Models, Oberwolfach, Germany, 1998.

Keynote speaker:

Conference on Stochastic Processes and Their Applications, Enschede, The Netherlands, 1977.
Conference on Parallel and Distributed Computer Systems, Kyoto University, Japan, 1988.
TIMS/ORSA Applied Probability Meeting, Monterey, 1991.
Operations Research Meeting, Lunteren, The Netherlands, 1992.

INVITED TALKS AT UNIVERSITIES AND INDUSTRIAL ORGANIZA-

TIONS:

Yale University, U.C.L.A., Syracuse University, University of Montreal, Colorado State University, Eindhoven University (Netherlands), University of Bonn (Germany), Georgia Institute of Technology, Virginia Polytechnic Institute, University of Kentucky, Johns Hopkins University, Linköping University (Sweden), University of Cambridge (U.K.), Sheffield University (U.K.), Free University of Amsterdam (Netherlands), Technical University of Berlin (Germany), Humboldt University (East Germany), Freiberg University (East Germany), Rutgers University, George Mason University, Columbia University, University of Michigan, Tokyo University, Science University of Tokyo, Massachusetts Institute of Technology, University of Massachusetts at Amherst, University of Pennsylvania, Georgia Institute of Technology, Duke University, Science University of Tokyo, Tsukuba University (Japan), Kyoto University (Japan), Nara Institute of Science and Technology (Japan), Northwestern University, University of Southern Maine, SABRE Decision Technologies, N.C. State University, Lund University (Sweden), Technical University of Denmark, SUNY Buffalo.

UNIVERSITY, REGIONAL, NATIONAL AND/OR INTERNATIONAL COMMITTEES

1978-79	Council Member, College on Applied Probability, TIMS
1979	Review panel for NSF Engineering Research Initiation Grants
1980	Lanchester Prize Committee, ORSA
1981	Chair, International Meeting on Stochastic Systems, NCSU
1974-81	Associate Editor, *Management Science*
1975-85	Associate Editor, *Operations Research*
1985-90	Area Editor, Stochastic Processes and Applications, *Operations Research*
1985-	Associate Editor, *QUESTA (Queueing Systems: Theory and Applications)*
1988	Co-Chair, Fifth TIMS/ORSA Applied Probability Conference, University of North Carolina at Chapel Hill
1989	Co-Program Chair, TIMS International Meeting, Osaka, Japan
1990-91	Chair, TIMS College on Applied Probability
1993-	Editor, Stochastic Models Book Series, Chapman-Hall
1995	Editor, Special Issue on Design and Control of Queueing Systems, *QUESTA*
1995-96	Chair, Erlang Prize committee, INFORMS Section on Applied Probability
1995-98	Member, UNC-CH Faculty Council
2000-02	Member, INFORMS Expository Writing Prize Committee

PRIZES AND AWARDS

1999 Winner, Best Publication Prize, given by Society for Applied Probability of INFORMS, for the book, *Sample-Path Analysis of Queueing Systems* (M. El-Taha, co-author), Kluwer Academic Publishers, Boston, 1999 (300pp).

RESEARCH GRANTS

1968-70 N.Y. State Science and Technology Foundation, Cornell University, "Operations analysis and design of demand-responsive systems" associate investigator)

1968-71 U.S. Department of Transportation, "Analytical methodology and optimal control in urban traffic networks" (associate investigator)

1973-75 NSF Engineering Research Initiation Grant, Cornell University, "Stochastic congestion systems" (principal investigator)

1975-76 Departmental Research Grant, N.C. State University, "Optimal control of stochastic congestion systems" (principal investigator)

1975-76 N.C. Dept. of Corrections, N.C. State Univ., "Dynamic population model for prison populations" (associate investigator)

1977 NATO Research Grant, Technical University of Denmark and Aarhus University, "Optimal control of stochastic congestion systems" (principal investigator)

1979-82 NSF Research Grant, N.C. State Univ., "Control of stochastic service systems" (principal investigator)

1982-83 Science and Engineering Research Council (U.K.), University of Cambridge, "Applied probability models for complex stochastic systems" (principal investigator)

1982-86 U.S. Army Research Office, N.C. State Univ., "Networks of queues and queues with periodic Poisson input" (principal investigator)

1988-90 National Science Foundation, "Design and control of networks of queues" (principal investigator)

1989-91 IBM Research Grant: "Analysis and design of routing in virtual-circuit data networks" (co-principal investigator)

1994-98 National Science Foundation, "Stochastic Fluid-Flow Models for Control of Communication Networks" (co-principal investigator).

1999-00 IBM/CCI Research Grant: "Streamlining Manufacturing Operations in Presence of Testing" (co-principal investigator).

PUBLICATIONS

BOOKS

1. *Sample-Path Analysis of Queueing Systems* (with M. El-Taha), Kluwer Academic Publishers, Boston, 1999 (300pp).

2. *Design and Control of Queueing Systems*, CRC Press, London, expected completion date: 2003 (500pp).

ARTICLES

1. On the optimality of single-server queueing systems. *Operations Research* 18 (1970) 708-732.

2. Regenerative processes in the theory of queues, with applications to the alternating-priority queue. *Advances in Applied Probability* 4 (1972) 542-577.

3. $L = \lambda W$: a discounted analogue and a new proof. *Operations Research* 20 (1972) 1115-1126.

4. Stochastic clearing systems. *Stochastic Processes and Their Applications* 2 (1974) 85-133.

5. Optimal control of queueing systems (with N.U. Prabhu). In *Mathematical Methods in Queueing Theory*, B. Clarke (ed.), Lecture Notes in Economics and Mathematical Systems 98 (1974) Springer-Verlag, Berlin, 263-294.

6. A last word on $L = \lambda W$. *Operations Research* 22 (1974) 417-421. Cost models for stochastic clearing systems. *Operations Research* 25 (1977) 100-127.

7. Individual versus social optimization in exponential congestion systems (with S. Lippman). *Operations Research* 25 (1977) 233-247.

8. Semi-stationary clearing processes (with R.F. Serfozo). *Stochastic Processes and Their Applications* 6 (1978) 165-178.

9. Socially and individually optimal control of arrivals to a $GI/M/1$ queue. *Management Science* 24 (1978) 1598-1610.

10. The relation between customer and time averages in queues (with D.P. Heyman). *Operations Research* 28 (1980) 983-994.

11. Control of arrivals to a stochastic input-output system (with S.J. Johansen). *Advances in Applied Probability* 12 (1980) 972-999.

12. Action-dependent stopping times and Markov decision processes with unbounded rewards (with J. van Nunen). *O.R. Spektrum* 3 (1981) 145-152.

13. On the convergence of successive approximations in dynamic programming with non-zero terminal reward. *Zeitschrift für Operations Research* 25 (1981) 57-77.

14. Sample-path analysis of queues. In *Applied Probability/Computer Science: The Interface*, Vol. II, R.L. Disney, T.J. Ott (ed.), Birkhauser, Boston (1982) 41-70.

15. A note on transfer lines with unreliable machines, random processing times, and finite buffers (with T. Altiok). *IIE Transactions* 14 (1982) 125-127.

16. Individual versus social optimization in the allocation of customers to alternative servers (with C.E. Bell). *Management Science* 29 (1983) 831-839.

17. Optimal service-rate control of $M/G/1$ queueing systems using the method of phases (with K.Y. Jo). *Advances in Applied Probability* 15 (1983) 616-637.

18. The allocation of interstage buffer capacities in production lines (with T. Altiok). *IIE Transactions* 15 (1983) 292-299.

19. Continuous versions of the queueing formulas $L = \lambda W$ and $H = \lambda G$ (with T. Rolski). *Operations Research Letters* **2** (1983) 211-215.

20. Optimal control of admission, routing, and service in queues and networks of queues: a tutorial review. *Proc. ARO Workshop: Analytical and Computational Issues in Logistics R and D*, George Washington University (1984) 330-377.

21. Optimal control of admission to a queueing system. *IEEE Transactions on Automatic Control* **AC30** (1985) 705-713.

22. Control of arrivals to two queues in series (with H. Ghoneim). *European J. Operational Research* **21** (1985) 399-409.

23. Computing optimal control policies for queueing systems. *Proc. 24th IEEE Conference on Decision and Control* (1985) 1810-1814.

24. Clearing systems and (s, S) inventory systems with non-linear costs and positive lead times. *Operations Research* **34** (1986) 276-280.

25. Forward recursion for Markov decision processes with skip-free-to-the-right transitions (with J. Wijngaard). *Mathematics of Operations Research* **11** (1986) 295-308.

26. Stable recursive procedures for numerical computations in Markov models. *Annals of Operations Research* **8** (1987) 27-40.

27. Control of service rates in networks of queues (with R. Weber). *Advances in Applied Probability* **19** (1987) 202-218.

28. Scheduling, routing, and flow control in stochastic networks. In *Stochastic Differential Systems, Stochastic Control Theory and Applications* (1988), **IMA**-10, W. Fleming, P.L. Lions (ed.), Springer-Verlag, New York, 529-561.

29. Monotone and insensitive optimal policies for control of queues with undiscounted costs (with R. Weber). *Operations Research* **37** (1989) 611-625.

30. Sample-path analysis of processes with imbedded point processes (with M. El-Taha). *Queueing Systems* **5** (1989) 131-166.

31. On the relation between time averages and customer averages in queues. In *Variational Methods and Stochastic Analysis*, Ha-Jine Kimn and Dong Myung Chang (ed.), *Proc. Workshop in Pure Mathematics* **9** (1990) 243-278.

32. Optimal control of two parallel infinite-server queues (with R. Hariharan and V.G. Kulkarni). *Proc. 29th IEEE Conference on Decision and Control* (1990).

33. Iterative methods for determining derivatives of stationary distributions of finite Markov Chains, *Numerical Solutions of Markov Chains*, W. J. Stewart (ed.), Marcel Dekker, Inc. of New York (1991) 131-146.

34. Sample-path analysis of discrete-event systems (with M El-Taha). *Proc. 30th IEEE Conference on Decision and Control* (1991) 1145-1150.

35. A queueing-network model for half-duplex routing in data communication networks (with V.G. Kulkarni). *TRIC'OM-92: Proc. Fifth Conference on High-Speed Communication Networks*, Raleigh, NC (1992).

36. Admission to a general stochastic congestion system: comparison of individually and socially optimal policies (with M. Bartroli). In *Queueing and Related Models*, U.N. Bhat and I.V. Basawa (ed.), Oxford University Press (1992) 301-324.

37. Deterministic analysis of multi-channel queueing systems with heterogeneous servers (with M. El-Taha). *Theoretical Computer Science*, 106 (1992) 243-264.

38. A filtered *ASTA* property (with M. El-Taha). *Queueing Systems: Theory and Applications*, 11 (1992) 211-222.

39. Pricing and capacity decisions for a service facility: stability and multiple local optima, *Management Science*, **38** (1992) 1121-1139.

40. Sample-path analysis of stochastic discrete-event dynamic systems (with M. El-Taha) *Discrete-Event Dynamic Systems: Theory and Applications*, **3** (1993) 325-346.

41. A survey of Markov decision models for control of networks of queues (with R. Weber) *Queueing Systems: Theory and Applications* **13** (1993) 291-314.

42. A note on sample-path stability conditions for input-output processes (with M. El-Taha), *Operations Research Letters*, 14 (1993) 1-7.

43. Sample-path analysis of token rings (with E. Altman, S.G. Foss, E.R. Riehl). *Proceedings of 14th International Teletraffic Congress*, June 6-10, 1994, Antibes Juan-les-Pins, France.

44. A sample-path approach to Palm Probabilities, *J. Applied Probability*, **31** (1994) 430-437.

45. Successive approximations for Markovian decision processes with unbounded rewards: a review. In *Probability, Statistics and Optimisation: a Tribute to Peter Whittle*, F.P. Kelly (ed.), Wiley, Chichester, England (1994) 467-484.

46. Sample path stability conditions for multi-server input-output processes (with M. El-Taha), *J. Applied Mathematics and Stochastic Analysis*, **8** (1994) 437-456.

47. Sample path techniques in queueing theory (with M. El-Taha). *Advances in Queueing: Models, Methods and Problems*, J.H. Dshalalow (ed.), CRC Press, Inc., Boca Raton, Florida (1995) 119-166.

48. Optimal flow control of a stochastic fluid-flow system (with S. Rajagopal and V.G. Kulkarni). *IEEE Journal on Selected Areas in Communications*, **13** (1995) 1219-1228.

49. Asymptotic behavior of a relaxed flow-control algorithm for multiclass networks (with C.R. Rump). *Proc. 33rd Allerton Conference on Communication, Control, and Computing*, October 4-6, 1995, University of Illinois at Urbana-Champaign, 756-765.

50. Editorial introduction: Special Issue on Optimal Design and Control of Queueing Systems. *Queueing Systems: Theory and Applications*, **21** (1995) 239-244.

51. Optimality of monotonic policies in two-action Markovian decision processes (with E. Altman), *Queueing Systems: Theory and Applications*, **21** (1995) 267-292.

52. Sample-path insensitivity of symmetric queues in discrete-time (with M. El-Taha, R. Anand). *Proc. Second World Congress of Nonlinear Analysts*, July 10-17, 1996, Athens, Greece.

53. A queueing model for optimal segmentation of a token-ring local area network. *Proc. 35th IEEE Conference on Decision and Control*, December 11-13, 1996, Kobe, Japan, 1349-1351.

54. Decentralized rate-based flow control with bidding for priorities: equilibrium conditions and stability. *Proc. 35th IEEE Conference on Decision and Control*, December 11-13, 1996, Kobe, Japan, 2917-2920.

55. Scheduling in a multi-class series of queues with deterministic service times (with R. Hariharan, M. Moustafa). *Queueing Systems: Theory and Applications* **24** (1997) 83-100.

56. Performance bounds and pathwise stability for generalized vacation and polling systems (with E. Altman, S.G. Foss, E.R. Riehl). *Operations Research*, **45**6 (1998) 137-148.

57. Stability and chaos in a service facility with adaptive customer response to congestion (with C.M. Rump). *Management Science* 44 (1998) 246-261.

58. The underlying Markov decision process in the single-leg airline yield management problem (with C.J. Lautenbacher). *Transportation Science* **33** (1999) 136-146.

59. Airline yield management with cancellations, overbooking, and no-shows (with J. Subramanian and C.J. Lautenbacher). *Transportation Science* **33** (1999) 147-167.

60. Monotone optimal policies for left-skip-free Markov decision processes (with R. Weber), in *Recent Contributions in Applied Probability and Stochastic Processes* (in honor of Julian Keilson), J.G. Shanthikumar and U. Sumita, eds., Kluwer Academic Publishers, Boston (1999) 191-202.

61. Optimal Control of Markov chains, in *Advances in Computational Probability*, W. Grassmann, ed., Kluwer Academic Publishers, Boston (2000) 325-364.

62. Sample-path conservation laws, with applications to scheduling queues and fluid systems (with T.C. Green), to appear in *Queueing Systems: Theory and Applications* **36** (2000) 175-199.

63. Forward recursion for Markov decision processes with skip-free-to-the-right transitions, Part II: Non-standard applications (with J. Wijngaard). *Statistica Neerlandica* **54** (2000) 160-174.

64. Relaxed asynchronous flow-control algorithms for multi-class service networks (with C. Rump), *IIE Transactions* **32** (2000) 873–880.

65. Conservation laws for single-server fluid networks (with N. Bäuerle), *Queueing Systems: Theory and Applications* **38** (2001) 185–194.

66. Filtration of *ASTA*: a weak-convergence approach (with M. El-Taha), to appear in *J. Combinatorics, Information and Systems Sciences* (2001).

67. Analysis, design, and control of queueing systems, to appear in *Operations Research*, Special 50th Anniversary Issue (2002).

PERSONAL INFORMATION

Dr. Stidham is a member of the Board of the N.C. Symphony Foundation (Secretary and Investment Committee member) and a member of the Board of the N.C. Museum of Art Foundation (Finance Committee and Investment Committee member). He was a member of the Board of Directors of the Friends of the College musical series in Raleigh and Chair of the Program Committee. He is a choir member at Pullen Memorial Baptist Church in Raleigh. He is listed in *Who's Who in America*.