

March 2020

*Short Résumé*

**WARD WHITT**

*Current Employment*

Wai T. Chang Professor  
Department of Industrial Engineering and Operations Research  
Fu Foundation School of Engineering and Applied Science  
Columbia University  
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Citizenship: USA

*Education*

1969 Ph.D., Cornell University  
Major Field: Operations Research  
Thesis: Weak Convergence Theorems for Queues in Heavy Traffic  
(Advisor: D. L. Iglehart; Committee Members: H. Kesten and N. U. Prabhu)  
1964 A.B., Dartmouth College

*Research, Consulting and Teaching Interests*

Stochastic models in operations research, especially queueing models. Probability and stochastic Processes, limits and approximations. Performance analysis in telecommunication, manufacturing and service systems

*Employment History*

Columbia University in the City of New York

2002– Professor, Dept. of Industrial Engineering and Operations Research

AT&T (Bell Laboratories, 1977-1996; AT&T Laboratories, 1996-2002)

1996–2002 Technology Leader and AT&T Fellow,  
IP Network Management and Performance Department,  
Internet and Networking Systems Research Laboratory,  
Shannon Laboratory, Florham Park, NJ  
1987–1996 Member of Technical Staff, Mathematical Sciences  
Research Center, Murray Hill, NJ  
1977–1986 Member of Technical Staff, Operations Research Department,  
Holmdel, NJ

Yale University (1969-1973)

## *Honors*

- 2012 Manufacturing and Service Operations Management Society Distinguished Fellow Award
- 2011 INFORMS Expository Writing Award
- 2007 SEAS Alumni Association Distinguished Faculty Teaching Award
- 2007 Appointed Wai T. Chang Professor at Columbia University
- 2003 INFORMS Lanchester Prize for best publication in OR and MS (for 2002 book)
- 2002 INFORMS Inaugural Fellow
- 2001 INFORMS John von Neumann Theory Prize for fundamental, sustained contributions to theory in OR and MS
- 2001 Harold Larnder Prize for distinguished achievement in operational research, Canadian Operational Research Society
- 1998 Honorable mention for the INFORMS Lanchester Prize for the best publication in operations research, for a collection of papers on numerical transform inversion (with J. Abate, G. L. Choudhury, K. K. Leung and D. M. Lucantoni)
- 1998 Member of AT&T Labs Fellowship Program Committee, sharing in the Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring
- 1998 Marcel F. Neuts Best Paper Award, “Fluid and Diffusion Limits for Queues in Slowly Changing Random Environments,” *Stochastic Models*, 1997 (with Gagan L. Choudhury, Avi Mandelbaum and Martin I. Reiman).
- 1997 Selected to be an AT&T Fellow
- 1996 Elected to National Academy of Engineering

## *Professional Activities*

### Advisory Editor:

Mathematics of Operations Research, 1990–  
Operations Research, 2006–

### Area Editor:

Mathematics of Operations Research, 1987–1990

### Associate Editor:

Operations Research, 1974-1976  
Mathematics of Operations Research, 1978-1986  
Journal of Stochastic Processes and Their Applications, 1979-1984  
Queueing Systems: Theory and Applications, 1985-2012  
Journal of Applied Probability, 1989-2012  
Advances in Applied Probability, 1989-2012  
Discrete Event Dynamic Systems: Theory and Applications, 1990–1999  
Telecommunications Systems 1992–1994  
Journal of the Operations Research Society of Japan 1997–1999

Participation in the activities of the Institute for Operations Research and Management Science (INFORMS), formerly the Operations Research Society of America, and in the Applied Probability Special Interest Group: presentations, session chairman and session organizing. Vice Chairman of Special Interest Group 1986, Chairman 1987.

*Doctoral Dissertations Advised (not always as principal advisor, but significant participation).*

*Yale University:*

- Dirickx, Yvo. Dynamic Programming Models with Discount Factor Greater Than One, 1971.
- Goodman, David. Modified Sectioning Search Approach to Aggregate Planning, 1972.
- Sanghvi, Arun. The Asymptotic Behavior of Some Sequential Games, 1973.
- Roth, Carl. A Multiperson Theory of Organizational Decision-Making, 1974.
- Winston, Wayne. Optimal Operation of Congestion Systems, 1975
- Pomarede, Jean-Michel. A Unified Approach Via Graphs to Skorohod's Topologies, 1975.
- Thomas, Annie. Approximation Procedures for Capacity Expansion Models, 1977.
- Sonderman, David. Comparison Results for Stochastic Processes Arising in Queueing Systems, 1978.
- Green, Linda. Queues Which Allow a Random Number of Servers Per Customer, 1978.

*While at Bell Labs: New York University and George Washington University:*

- Burman, David. An Analytic Approach to Diffusion Approximations in Queueing, 1979.
- Wallace, Rodney B. Performance Modelling and Design of Call Centers with Skill-Based Routing, 2004.

*Columbia University:*

- Albin, Susan. Approximations for Queues with Superposition Arrival Processes, 1981. (while at Bell Laboratories)
- Gurvich, Itay. Staffing and Control of Many-Server Service Systems, 2008.
- Talreja, Rishi. Essays on Heavy-Traffic Approximations for Many-Server Queueing Systems, 2010.
- Park, Kun Soo. Applications of Stochastic Modeling to Quantitative Finance and Operations Management, 2010.
- Perry, Ohad. Heavy-Traffic Limits via an Averaging principle for Service Systems Responding to Unexpected Overloads, 2010.
- Ibrahim, Rouba. Delay Estimation in Many-Server Queues, 2010.
- Pang, Guodong. Heavy-Traffic Limits for Many-Server Service Systems with Interruptions and Feedback, 2010.
- Liu, Yunan. Many-Server Queues with Time-Varying Arrivals, Customer Abandonment and Non-Exponential Distributions, 2011.
- Kim, Song-Hee. Data-Driven Decisions in Service Systems, 2014.

Ma, Ni. Efficient Simulation and Performance Stabilization for Time-Varying Single-Server Queues, 2019.

Sun, Xu. Staffing and Scheduling to Differentiate Service in Many-Server Service Systems, 2019.

You, Wei. A Robust Queueing Network Analyzer Based on Indices of Dispersion, 2019.

Zhang, Xiaopei. Periodic Little's Law, 2019.

#### Ten Selected Publications (of more than 390)

Multiple Channel Queues in Heavy Traffic I, *Advances in Applied Probability*, vol. 2, No. 1, Spring 1970, pp. 150-177 (with Donald Iglehart).

Heavy-Traffic Limits for Queues with Many Exponential Servers, *Operations Research*, vol. 29, No. 3, May-June 1981, pp. 567-588 (with Shlomo Halfin).

The Queueing Network Analyzer, *Bell System Technical Journal*, vol. 62, No. 9, November 1983 pp. 2779-2815.

Characterizing Superposition Arrival Processes in Packet Multiplexers for Voice and Data. *IEEE Journal on Selected Areas in Communications*, vol. SAC-4, No. 6, September 1986, pp. 833-846 (with K. Sriram).

Planning Queueing Simulations. *Management Science*, vol. 35, No. 11, 1989, pp. 1341-1366.

The Fourier-Series Method for Inverting Transforms of Probability Distributions. *Queueing Systems*, vol. 10, No. 1, 1992, pp. 5-88 (with Joseph Abate).

Logarithmic Asymptotics for Steady-State Tail Probabilities in a Single-Server Queue. *Studies in Applied Probability, Papers in Honour of Lajos Takács*, J. Galambos and J. Gani (eds.), Applied Probability Trust, Sheffield, England, 1994, pp. 131-156 (with Peter W. Glynn).

Calculating Normalization Constants of Closed Queueing Networks by Numerically Inverting Their Generating Functions. *Journal of the Association for Computing Machinery*, vol. 42, 1995, pp. 935-970 (with Gagan L. Choudhury and Kin K. Leung).

Server Staffing to Meet Time-Varying Demand. *Management Science*, vol. 42, No. 10, 1996, pp. 1383-1394 (with Otis B. Jennings, Avishai Mandelbaum and William A. Massey).

*Stochastic-Process Limits*, Springer, New York, 2002, 602 pages.  
(<http://www.columbia.edu/~ww2040/book.html>).