

Yingdong Lu

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Education

Ph.D., Operations Research, Columbia University, New York, 1999.

M.S., Operations Research, Columbia University, New York, 1996.

B.S., Mathematics, Peking University, Beijing, 1992.

Work Experiences

- December 2000 – Present, **Research Staff Member**, IBM T.J. Watson Research Center
- September 1999 – November 2000, **Postdoctoral Research Fellow**, Graduate School of Management, University of California, Irvine
- September 1994 – September 1999, **Teaching Assistant and Research Assistant**, Department of IE/OR, Columbia University.

Selected Publications

1. (with M. Bichler, etc) Applications of flexible pricing in business-to-business electronic commerce, *IBM System Journal*, **41**(2),287-302, 2002.
2. (with J. Song and D. Yao) Order fill rate, leadtime variability, and advance demand information in an assemble-to-order system. *Operations Research*, **51** 292-308, 2003.
3. (with D. Yao) Optimal control of a fluid network with side constraints. *IEEE Transactions on Automatic Control*, **48**, 1865-1869, 2003.
4. (with X Guo and M. S. Squillante) Optimal probabilistic routing in distributed parallel queues. *SIGMETRICS Performance Evaluation Review*, **32**(2),53-54,2004.
5. (with J. Song) Order-based cost optimization in assemble-to-order systems. *Operations Research*, **53**, 151-169, 2005.
6. (with J. Song and D. Yao) Backorder minimization in multiproduct assemble-to-order systems. *IIE Transactions*, **37**(8), 763-774, 2005.
7. (with M. S. Squillante) Dynamic scheduling to optimize utility functions of sojourn time moments in queueing systems. *SIGMETRICS Performance Evaluation Review*, **33**(2), 42-44, 2005.
8. Solving optimal control problems through optimizations. *IEEE Transactions on Automatic Control*, **50**, 890-894, 2005.
9. Estimation of average backorders for an assemble-to-order system with random batch demands through extreme statistics. *Naval Logistic Research*, vol 54, No. 1, 33-45, 2007.
10. Performance analysis for assemble-to-order systems with general renewal arrivals and random batch demands, *European Journal of Operations Research*, vol 185, No. 2, 635-647, 2008.
11. (With S. Bhadra and M. Squillante) Optimal capacity planning in stochastic loss networks with time-varying workloads, *Proceedings of ACM/SIGMETRICS*, 2007.

12. (with A. Radovanović) Asymptotic blocking probability in loss systems with subexponential demands, *Journal of Applied Probability*, **44**, 2007, 1088-1102.
13. (with G. Lin and D. Yao) The stochastic knapsack revisited: switch-over policies and dynamic pricing, *Operations Research*, **56**, 945-957. 2008.
14. (with K. Jung, M.Sharma, D. Shah & M. Squillante) Loss network revisited. *Proceedings of 2008 ACM/SIGMETRICS*.
15. Performance analysis of $M/D_K/1$ queue under fair sojourn protocol in heavy traffic, *Probability in Industrial & Information Theory*, vol 23, No. 1, 61-74, 2009.
16. (with J. Anselmi, M. Sharma and M. Squillante) Improved algorithms for Erlang loss formula, *QUESTA*, **63**(4), 2009.
17. (with J.Song and Y. Zhao) Dynamic No-Hold-Back Allocation Rules for Assemble-to-Order Systems: Optimality and Comparison, *Operation Research*, **58**(3), 691-705, 2010.
18. (with J. Hu, A. Mojsilović, M. Sharma and M. Squillante) Performance Management of IT Services Delivery, *Performance Evaluation Review*, Volume 37, Issue 4, 50-57, 2010.
19. Ratio Between Average Sojourn Times under Processor Sharing and Fair Sojourn Protocol, *Probability in Industrial & Information Theory*, **24**, 485-490, 2010.
20. (with M. Squillante) On Approximations for Multiple Multidimensional Stochastic Knapsacks. *SIGMETRICS Performance Evaluation Review*, **38**(2): 45-47 (2010)
21. (with H. Cao et. al.) OnTheMark: Integrated Stochastic Resource Planning of Human Capital Supply Chains, **winning entry of the 2011 Daniel H. Wagner Prize**, *Interfaces*, Volume 41, No. 5, 414-435, 2011.
22. (With F. Cheng, M. Ettl & D. Yao) A Two-Stage Push-Pull Production Planning Model, *Production and Operations Management*, Volume 21, Issue 4, 668-681, 2012.
23. (with M. Singh et al) Sales-Force Performance Analytics and Optimization, *IBM Journal of Research and Development*, Volume 56, Issue 6, 8:1-8:10, 2012.
24. (With Yue Tan and Cathy Xia) Provisioning of Large Scale Cloud Computing via Loss Networks, *Proceedings of ACM/SIGMETRICS 2012*.
25. Finite Horizon Ruin Probabilities for Random Walks with Heavy Tailed Increments, *Probability in Industrial & Information Theory*, , Volume 27, No. 2, 237-246, 2013.
26. (with X. Gao, et al) Stochastic optimal control for a general class of dynamic resource allocation problems, *The 31st international symposium on computer performance, modeling, measurements and evaluation (IFIPWG 7.3 Performance)*, 2013.
27. (with M. Sharma & M. Squillante) Workforce management: Risk-based financial planning and capacity provisioning, *IBM Journal of Research and Development*, Volume, 58, Issue 4, 2014.
28. (M. Squillante, C. Wu & B. Zhang) On the Control of Epidemic-Like Stochastic Processes with Time-Varying Behavior, *ACM SIGMETRICS Performance Evaluation Review*, Volume 43 Issue 2, 78-80, 2015.
29. (with D. Goldberg et al) Asymptotic Optimality of Constant-Order Policies for Lost Sales Inventory Models with Large Lead Times, *Mathematics of Operations Research*, Volume 41(3), 898-913, 2016.

30. (with M. Sharma, M. Squillante & B. Zhang) Stochastic Optimal Dynamic Control of $GI_m/GI_m/1_n$ Queues with Time-Varying Workloads, *Probability in Industrial & Information Theory*, Volume 30(3), 470-491, 2016.
31. (with S. Maguluri, M. Squillante & C. Wu) On Optimal Portfolios of Dynamic Resource Allocations, *Proceedings of ACC*, 2017.
32. (with M. Squillante & C. Wu) Epidemic-Like Stochastic Processes with Time-Varying Behavior: Structural Properties and Asymptotic Limits, *IFIP Performance, The 35th International Symposium on Computer Performance, Modeling, Measurements and Evaluation 2017, New York, USA*.
33. (with S. Maguluri et al) An Optimal Scheduling Policy for the 22 Input-Queued Switch With Symmetric Arrival Rates, *IFIP Performance, The 35th International Symposium on Computer Performance, Modeling, Measurements and Evaluation 2017, New York, USA*.
34. (with M. Davis et al) Stochastic Optimization Models for Workforce Planning, Operations, and Risk Management, *Service Science*, Vol 10(1), 40-57, 2018.
35. Heuristic policies for stochastic knapsack problem with time-varying random demand: Stochastic Knapsack Problem, *Applied Stochastic Models in Business and Industry*, Vol 34(4), 1007-1016, 2018.

Selected Research Projects

- Dynamic pricing and reverse logistics, 2001-2002
 - Develop bidding strategies in enterprise computer and server market for IBM;
 - Develop dynamic pricing strategies and sales channels optimization tools for IBM Global Finance in the out-of-lease product market.
- Hub min-max inventory management, 2005-2006
 - Develop a vendor managed inventory management tool under liability contacts for IBM server group;
 - Awarded an IBM Research Division Award;
- Workforce management, 2007-2009
 - Design and develop a series of workforce planning tools for various IBM service organizations for cost saving, profit maximizing and productivity improving.
 - Awarded an IBM Research Division Award and IBM Corporate Extraordinary Accomplishment Award;
 - Awarded the Daniel H. Wagner Prize for Excellence in Operations Research Practice.
- Sales Territory Optimization Tool, 2007-2010
 - Design and develop algorithms for optimally allocated sales force to the right sales territory to maximize productivity;
 - Awarded an IBM Research Division Award and an Outstanding Technical Achievement Award.
- Quota Optimization Project, 2011-2016
 - Design and develop stochastic optimization capability for corporate quota/target allocation
 - Awarded an IBM Research Division Award

- Route-to-Market: Capacity Planning for Client Alignment, 2015-2016
 - Data-driven capacity planning tool for sales, service and delivery alignment

Patents

- US Patent 7139733 - Method and structure for bid winning probability estimation and pricing model.
- US Patent 8458075 - Method and apparatus for commodity sourcing management.
- Nine US patents pending

Honors and Awards

- Multiple IBM Research Division Award;
- IBM Extraordinary Accomplishment Award 2015;
- IBM Outstanding Technical Achievement Award 2010, 2015;
- IBM Invention Achievement Award 2008;
- IBM Corporate Award 2018
- The Daniel H. Wagner Prize for Excellence in Operations Research Practice, 2010.
- Elected member of International Federation of Information Processing Working Group 7.3 (IFIP WG 7.3), 2013.
- IEEE Senior Member 2015
- The Stevie Award 2017

Other Professional Activities

- General chair, IFIP Performance, The 35th International Symposium on Computer Performance, Modeling, Measurements and Evaluation 2017, New York, USA.
- Conference technical/organization committees
 - The Seventh International Conference on Matrix-Analytic Methods in Stochastic Models (MAM7)
 - The International Teletraffic Congress, 2010, 2011, 2016, 2017.
 - IFIP Performance 2014.
 - ACM SIGMETRICS 2010.
 - The Workshop on MATHematical performance Modeling and Analysis 2005-2018.
 - IEEE MASCOTS 2016.
 - INFORMS International Meeting 2018
 - The Franz Edelman Award committee, 2011-2017
 - First International Conference on Performance Evaluation Methodologies and Tools, 2006.
 - INFORMS George Nicholson Student Paper Committee 2015-2016
- Guest editor: *Service Science*, special issue on quantitative methods on workforce management, 2010.

- Conferences presentations(*INFORMS, Applied Probability Conference, MS&OM, Bernoulli Society Conference, Conference of Stochastic Processes and Applications, ACM/SIGMETRICS*).
- Paper reviewing for *Computer and Operations Research, Discrete Event Dynamic Systems, European Journal of Operations Research, Journal of Applied Probability, IEEE TAC, IEEE Communications, IIE Transactions, Interfaces, Journal of Optimization - Theory and Applications, Management Science, Manufacture and Service Operation Management, Mathematical Reviews, Mathematics of Operations Research, Naval Logistic Research, Omega, Operations Research, Probability and Statistics Letters, Probability in Industrial & Information Theory, Queueing Systems, Service Science, and Stochastic Models*.

Professional Membership

American Mathematical Society, IEEE, INFORMS.