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Distinguished Visiting Scholar

Lancaster University Management School

Lancaster, UK

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- **Research Interests:** Design and analysis of computer simulation experiments on models of stochastic systems, particularly statistical efficiency, simulation analytics, simulation optimization, multivariate and nonstationary input modeling, uncertainty quantification and metamodeling. Applications include computer-performance modeling, manufacturing systems, financial engineering and transportation.

- **Education**

Ph.D. (December 1983), M.S. (May 1981), Operations Research, School of Industrial Engineering, Purdue University.

B.A. (May 1979), Mathematics and Computer Science, DePauw University, Greencastle, Indiana.

- **Professional Experience (University)**

Associate Professor (1995–1998), Professor (1998–present), Department of Industrial Engineering and Management Sciences, Northwestern University. Director of Master of Engineering Management Program (1998–2007). Department Chair (2008–2014). Director of Graduate Studies (2016–2017).

Visiting Professor, City University of Hong Kong (Fall 2014).

Distinguished Visiting Scholar, Lancaster University Management School (2013–present).

Assistant Professor (1984–1989), Associate Professor (1989–1995), Department of Industrial and Systems Engineering and Department of Statistics, The Ohio State University.

Visiting Assistant Professor, Department of Industrial and Systems Engineering, The Ohio State University (Summer 1984).

Visiting Assistant Professor, School of Industrial Engineering, Purdue University (Spring 1984).

- **Professional Experience (Industry)**

Consultant to Obama campaign for election poll staffing (2012).

Consultant to Whirlpool Corporation for simulation models to coordinate batch manufacturing and flexible assembly of refrigerators (2010).

Consultant to On Time Systems, Inc. for validation of large-scale simulation models (2005).

Consultant to Chas. Levy Company for supply chain analysis (2002–2004).

Consultant to J. B. Collins Associates for financial engineering models of crop insurance risk (2000–2002).

Consultant to Dell Computer for production and procurement planning (2000).

Consultant to Emery Worldwide Airlines, Inc. to audit statistical sampling procedures for estimating mail volume (1999).

Consultant to Sloan Valve Co. for development of simulation models of a new milling operation (1999).

Consultant to Norwegian Defense Establishment on simulation experiment design and analysis (1998).

Consultant to Carsonite International, Inc. for financial planning simulation models (1997).

Consultant to the Port of Singapore Authority for design of an automated material handling system (1996–1997).

Consultant to Rockford Powertrain Inc. for financial planning simulation models (1996).

Consultant to LEXIS-NEXIS for statistical analysis of simulation and computer performance modeling (1991–1997).

Consultant to Litel Corporation to develop simulation models to forecast customer mix and revenues for long-distance telephone service (1988).

- **Refereed Publications**

B. L. Nelson, A. T. K. Wan, G. Zou, X. Zhang and X. Jiang, “Reducing Simulation Input-Model Risk via Input Model Averaging,” *INFORMS Journal on Computing* (2020), Articles in Advance.

M. Semelhago, B. L. Nelson, E. Song and Andreas Wächter, “Rapid Discrete Optimization via Simulation with Gaussian Markov Random Fields,” *INFORMS Journal on Computing* (2020), Articles in Advance.

E. Song, P. Wu-Smith and B. L. Nelson, “Uncertainty Quantification in Vehicle Content Optimization for General Motors,” *INFORMS Journal on Applied Analytics* **50** (2020), 225–238.

G. Jiang, L. J. Hong and B. L. Nelson, “Online Risk Monitoring using Online Simulation,” *INFORMS Journal on Computing* **32** (2020), 356–375.

L. E. Morgan, B. L. Nelson, A. C. Titman and D. J. Worthington, “Detecting Bias Due to Input Modelling in Computer Simulation,” *European Journal of Operational Research* **279** (2019), 869–881.

- P. Salemi, B. L. Nelson and J. Staum, “Generalized Integrated Brownian Fields for Simulation Metamodeling,” *Operations Research* (2019) **67** (2019), 874–891.
- Y. Lin, B. L. Nelson and L. Pei, “Virtual Statistics in Simulation via  $k$  Nearest Neighbors,” *INFORMS Journal on Computing* **31** (2019), 576–592.
- P. Salemi, E. Song, B. L. Nelson and J. Staum, “Gaussian Markov Random Fields for Discrete Optimization via Simulation: Framework and Algorithms,” *Operations Research* **67** (2019), 250–266.
- E. Song and B. L. Nelson, “Input-Output Uncertainty Comparisons for Discrete Optimization via Simulation,” *Operations Research* **67** (2019), 295–597.
- Y. Lin and B. L. Nelson, “Variance and Derivative Estimation for Virtual Performance,” *ACM TOMACS* **28** (2018), 17:1–20.
- B. L. Nelson, “Replicated Computations Results (RCR) Report for “Green Simulation: Reusing the Output of Repeated Experiments,” *ACM Transactions on Modeling and Computer Simulation* **27** (2017), 24:1–2.
- I. Gerhardt, B. L. Nelson and M. R. Taaffe, “Technical Note: The  $MAP_t/Ph_t/\infty$  Queueing System and Multiclass  $[MAP_t/Ph_t/\infty]^K$  Queueing Network,” *INFORMS Journal of Computing* **29** (2017), 367–376.
- W. Xie, R. R. Barton and B. L. Nelson, “Multivariate Input Uncertainty in Output Analysis for Stochastic Simulation,” *ACM Transactions on Modeling and Computer Simulation* **27.5** (2016).
- E. Song, B. L. Nelson and J. Staum, “Shapley Effects for Global Sensitivity Analysis: Theory and Computation,” *SIAM/ASA Journal of Uncertainty Quantification* **4** (2016), 1060–1083.
- W. Fan, L. J. Hong and B. L. Nelson, “Indifference-zone-free Selection of the Best,” *Operations Research* **64** (2016), 1499–1514 .
- S. Lee and B. L. Nelson, “General-Purpose Ranking & Selection for Computer Simulation,” *IIE Transactions* **48** (2016), 555–564.
- B. L. Nelson, “‘Some Tactical Problems in Digital Simulation’ for the Next Ten Years,” *Journal of Simulation* **10** (2016), 2–11.
- P. Salemi, B. L. Nelson and J. Staum, “Moving Least Squares Regression for High-Dimensional Stochastic Simulation Metamodeling,” *ACM Transactions on Modeling and Computer Simulation* **26.3** (2016).
- J. Luo, L. J. Hong, B. L. Nelson and Y. Wu, “Sequential Procedures for Large-Scale Ranking-and-Selection Problems in Parallel Computing Environments,” *Operations Research* **63** (2015), 1177–1194.
- E. Song and B. L. Nelson, “Quickly Assessing Contributions to Input Uncertainty,” *IIE Transactions* **47** (2015), 1–17.
- Y. Lin, E. Song and B. L. Nelson, “Single-Experiment Input Uncertainty,” *Journal of Simulation* **9** (2015), 249–259.
- L. J. Hong, J. Luo, and B. L. Nelson, “Chance Constrained Selection of the Best, *INFORMS Journal on Computing* **27** (2015), 317–334.

- W. Xie, B. L. Nelson, and R. R. Barton, “A Bayesian Framework for Quantifying Uncertainty in Stochastic Simulation,” *Operations Research* **62** (2014), 1439–1452.
- R. R. Barton, W. Xie and B. L. Nelson, “Quantifying Input Uncertainty via Simulation Confidence Intervals,” *INFORMS Journal on Computing* **26** (2014), 74–87.
- X. Chen, B. E. Ankenman and B. L. Nelson, “Enhancing Stochastic Kriging Metamodels with Gradient Estimators,” *Operations Research* **61** (2013), 512–528.
- W. L. Xu and B. L. Nelson, “Empirical Stochastic Branch-and-Bound for Optimization via Simulation,” *IIE Transactions* **45** (2013), 685–698.
- X. Chen, B. E. Ankenman and B. L. Nelson, “The Effects of Common Random Numbers on Stochastic Kriging Metamodels,” *ACM Transactions on Modeling and Computer Simulation* **22** (2012), 7:1–7:20.
- J. Xu, B. L. Nelson and L. J. Hong, “An Adaptive Hyperbox Algorithm for High-Dimensional Discrete Optimization via Simulation Problems,” *INFORMS Journal on Computing* **25** (2013), 133–146.
- B. L. Nelson and I. Gerhardt, “Modeling and Simulating Nonstationary Arrival Processes to Facilitate Analysis,” *Journal of Simulation* **5** (2011), 3–8.
- F. Yang, J. Liu, B. L. Nelson, B. E. Ankenman and M. Tongarlak, “Metamodeling for Cycle Time-Throughput-Product Mix Surfaces using Progressive Model Fitting,” *Production Planning and Control* **22** (2011), 50–68.
- L. J. Hong, B. L. Nelson and J. Xu, “Speeding up COMPASS for High-dimensional Discrete Optimization via Simulation,” *Operations Research Letters* **38** (2010), 550–555.
- H. Lan, B. L. Nelson and J. Staum, “A Confidence Interval Procedure for Expected Shortfall Risk Measurement via Two-Level Simulation,” *Operations Research* **58** (2010), 1481–1490.
- M. Tongarlak, B. E. Ankenman, B. L. Nelson, L. Borne and K. Wolfe, “Using Simulation Early in the Design of a Fuel Injector Production Line,” *Interfaces* **40** (2010), 105–117.
- B. E. Ankenman, B. L. Nelson and J. Staum, “Stochastic Kriging for Simulation Metamodeling,” *Operations Research* **58** (2010), 371–382.
- H. Wan, B. E. Ankenman and B. L. Nelson, “Improving the Efficiency and Efficacy of Controlled Sequential Bifurcation for Simulation Factor Screening,” *INFORMS Journal on Computing* **22** (2010), 482–492.
- J. Xu, L. J. Hong and B. L. Nelson, “Industrial Strength COMPASS: A Comprehensive Algorithm and Software for Optimization via Simulation,” *ACM Transactions on Modeling and Computer Simulation* **20** (2010), 1–29.
- I. Gerhardt and B. L. Nelson, “Transforming Renewal Processes for Simulation of Nonstationary Arrival Processes,” *INFORMS Journal on Computing* **21** (2009), 630–640.
- S. C. Tsai and B. L. Nelson, “Fully Sequential Selection Procedures with Control Variates,” *IIE Transactions* **42** (2009), 71–82.
- J. E. Bekki, G. Mackulak, J. W. Fowler and B. L. Nelson, “Indirect Cycle Time Quantile Estimation using the Cornish-Fisher Expansion,” *IIE Transactions* **42** (2009), 31–44.
- S. C. Tsai, B. L. Nelson and J. Staum, “Combined Screening and Selection of the Best with Control Variates,” in *Advancing the Frontiers of Simulation*, ed. C. Alexopoulos, D. Goldsman and J. R. Wilson (2009), Springer, NY.

- F. Yang, B. E. Ankenman and B. L. Nelson, “Estimating Cycle Time Percentile Curves for Manufacturing Systems via Simulation,” *INFORMS Journal on Computing* **20** (2008), 628–643.
- B. Biller and B. L. Nelson, “Evaluation of the ARTAFIT Method for Fitting Time-Series Input Processes for Simulation,” *INFORMS Journal on Computing* **20** (2008), 485–498.
- V. Lesnevski, B. L. Nelson and J. Staum, “An Adaptive Procedure for Estimating Coherent Risk Measures based on Generalized Scenarios,” *Journal of Computational Finance* **11** (2008), 1–31.
- J. W. Fowler, S. E. Leach, G. T. Mackulak and B. L. Nelson. “Variance-based Sampling for Simulating Cycle Time-Throughput Curves using Simulation-based Estimates,” *Journal of Simulation* **2** (2008), 69–80.
- V. Lesnevski, B. L. Nelson and J. Staum, “Simulation of Coherent Risk Measures Based on Generalized Scenarios,” *Management Science* **53** (2007), 1756–1769.
- L. J. Hong and B. L. Nelson, “A Framework for Locally Convergent Random-Search Algorithms for Discrete Optimization via Simulation,” *ACM Transactions on Modeling and Computer Simulation* **17** (2007), 19/1–19/22.
- L. J. Hong and B. L. Nelson, “Selecting the Best System when Systems are Revealed Sequentially,” *IIE Transactions* **39** (2007), 723–734.
- F. Yang, B. E. Ankenman and B. L. Nelson, “Efficient Generation of Cycle Time-Throughput Curves through Simulation and Metamodeling,” *Naval Research Logistics* **54** (2007), 78–93.
- J. Pichitlamken, B. L. Nelson and L. J. Hong, “A Sequential Procedure for Neighborhood Selection-of-the-best in Optimization via Simulation,” *European Journal of Operational Research* **173** (2006), 283–298.
- B. L. Nelson and J. Staum, “Control Variates for Screening, Selection and Estimation of the Best,” *ACM Transactions on Modeling and Computer Simulation* **16** (2006), 52–75.
- H. Wan, B. E. Ankenman and B. L. Nelson, “Controlled Sequential Bifurcation: A New Factor-Screening Method for Discrete-Event Simulation,” *Operations Research* **54** (2006), 743–755.
- S-H. Kim and B. L. Nelson, “On the Asymptotic Validity of Fully Sequential Selection Procedures for Steady-State Simulation,” *Operations Research* **54** (2006), 475–488.
- L. J. Hong and B. L. Nelson, “Discrete Optimization via Simulation using COMPASS,” *Operations Research* **54** (2006), 115–129.
- S-H. Kim, B. L. Nelson and J. R. Wilson, “Some Almost-Sure Convergence Properties Useful in Sequential Analysis,” *Sequential Analysis* **24** (2005), 411–419.
- B. Biller and B. L. Nelson, “Fitting Time Series Input Processes for Simulation,” *Operations Research* **53** (2005), 549–559.
- L. J. Hong and B. L. Nelson, “The Tradeoff Between Sampling and Switching: New Sequential Procedures for Indifference-Zone Selection,” *IIE Transactions* **37** (2005), 623–634.
- E. K. Bish, F. Y. Chen, Y. T. Leong, B. L. Nelson, J. W. C. Ng and D. Simchi-Levi, “Dispatching Vehicles in a Mega Container Terminal,” *OR Spectrum* **27** (2005), 491–506.

- B. L. Nelson, “50th Anniversary Article: Stochastic Simulation Research in *Management Science*,” *Management Science* **50** (2004), 855–868.
- B. L. Nelson and M. R. Taaffe, “The  $\text{Ph}_t/\text{Ph}_t/\infty$  Queueing System: Part I—The Single Node,” *INFORMS Journal on Computing* **16** (2004), 266–274.
- B. L. Nelson and M. R. Taaffe, “The  $[\text{Ph}_t/\text{Ph}_t/\infty]^K$  Queueing System: Part II—The Multi-class Network,” *INFORMS Journal on Computing* **16** (2004), 275–283.
- J. Pichitlamken and B. L. Nelson, “A Combined Procedure for Optimization via Simulation,” *ACM Transactions on Modeling and Computer Simulation* **13** (2003), 155–179.
- B. Biller and B. L. Nelson, “Modeling and Generating Multivariate Time-Series Input Processes using a Vector Autoregressive Technique,” *ACM Transactions on Modeling and Computer Simulation* **13** (2003), 211–237.
- J. Boesel, B. L. Nelson and S. Kim, “Using Ranking and Selection to ‘Clean Up’ After Simulation Optimization,” *Operations Research* **51** (2003), 814–825.
- J. Boesel, B. L. Nelson and N. Ishii, “A Framework for Simulation-Optimization Software,” *IIE Transactions* **35** (2003), 221–230.
- D. Goldsman, S-H. Kim, W. S. Marshall and B. L. Nelson, “Ranking and Selection for Steady-State Simulation: Procedures and Perspectives,” *INFORMS Journal on Computing* **14** (2002), 2–19.
- J. O. Miller, B. L. Nelson and C. H. Reilly, “Estimating the Probability that a Simulated System will be the Best,” *Naval Research Logistics* **49** (2002), 341–358.
- S. Kim and B. L. Nelson, “A Fully Sequential Procedure for Indifference-Zone Selection in Simulation,” *ACM Transactions on Modeling and Computer Simulation* **11** (2001), 251–273.
- B. L. Nelson, J. Swann, D. Goldsman and W. Song, “Simple Procedures for Selecting the Best Simulated System when the Number of Alternatives is Large,” *Operations Research* **49** (2001), 950–963.
- B. L. Nelson and S. Banerjee, “Selecting a Good System: Procedures and Inference,” *IIE Transactions* **33** (2001), 149–166.
- B. L. Nelson and D. Goldsman, “Comparisons with a Standard in Simulation Experiments,” *Management Science* **47** (2001), 449–463.
- P. P. Ware, T. W. Page and B. L. Nelson, “Automatic Modeling of File System Workloads Using Two-Level Arrival Processes,” *ACM Transactions on Modeling and Computer Simulation* **8** (1998), 305–330.
- T. Hesterberg and B. L. Nelson, “Control Variates for Probability and Quantile Estimation,” *Management Science* **44** (1998), 1295–1312.
- J. O. Miller, B. L. Nelson and C. H. Reilly, “Efficient Multinomial Selection in Simulation,” *Naval Research Logistics* **45** (1998), 459–482.
- M. C. Cario and B. L. Nelson, “Numerical Methods for Fitting and Simulating Autoregressive-to-Anything Processes,” *INFORMS Journal on Computing* **10** (1998), 72–81.
- J. C. Hsu and B. L. Nelson, “Multiple Comparisons in the General Linear Model,” *Journal of Computational and Graphical Statistics* **7** (1998), 23–41.

- B. L. Nelson, B. Schmeiser, M. R. Taaffe and J. Wang, "Approximation-Assisted Estimation," *Operations Research Letters* **20** (1997), 109–118.
- Y-H. Tao and B. L. Nelson, "Computer-Assisted Simulation Analysis," *IIE Transactions* **29** (1997), 221–231.
- M. C. Cario and B. L. Nelson, "Autoregressive to Anything: Time-Series Input Processes for Simulation," *Operations Research Letters* **19** (1996), 51–58.
- B. L. Nelson and F. J. Matejcek, "Using Common Random Numbers for Indifference-Zone Selection and Multiple Comparisons in Simulation," *Management Science* **41** (1995), 1935–1945.
- F. J. Matejcek and B. L. Nelson, "Two-Stage Multiple Comparisons with the Best for Computer Simulation," *Operations Research* **43** (1995), 633–640.
- M. Yuan and B. L. Nelson, "Autoregressive Output Analysis Methods Revisited," Special Issue on Simulation and Modeling of *Annals of Operations Research* **53** (1994), 391–418.
- B. L. Nelson, "Robust Multiple Comparisons under Common Random Numbers," Special Issue on Variance Reduction Techniques of *ACM Transactions on Modeling and Computer Simulation* **3** (1993), 225–243.
- B. L. Nelson, "Estimating Acceptance-Sampling Plans for Dependent Production Processes," *IIE Transactions* **25** (1993), 11–18.
- B. L. Nelson and J. C. Hsu, "Control-Variate Models of Common Random Numbers for Multiple Comparisons with the Best," *Management Science* **39** (1993), 989–1001.
- M. Yuan and B. L. Nelson, "Multiple Comparisons With the Best for Steady-State Simulation," Technical Note in *ACM Transactions on Modeling and Computer Simulation* **3** (1993), 66–79.
- W. Yang and B. L. Nelson, "Multivariate Batch Means and Control Variates," *Management Science* **38** (1992), 1415–1431.
- W. Yang and B. L. Nelson, "Using Common Random Numbers and Control Variates in Multiple-Comparison Procedures," *Operations Research* **39** (1991), 583–591.
- B. L. Nelson, "Control-Variate Remedies," *Operations Research* **38** (1990), 974–992.
- B. L. Nelson, "Variance Reduction in the Presence of Initial-Condition Bias," *IIE Transactions* **22** (1990), 340–350.
- J. C. Hsu and B. L. Nelson, "Control Variates for Quantile Estimation," *Management Science* **36** (1990), 835–851.
- B. L. Nelson, "Batch Size Effects on the Efficiency of Control Variates in Simulation," *European Journal of Operational Research* **43** (1989), 184–196.
- B. L. Nelson, "Antithetic-Variate Splitting for Steady-State Simulations," *European Journal of Operational Research* **36** (1988), 360–370.
- A. P. Sharon and B. L. Nelson, "Analytic and External Control Variates for Queueing Network Simulation," *Journal of the Operational Research Society* **39** (1988), 595–602.
- R. Añonuevo and B. L. Nelson, "Automated Estimation and Variance Reduction via Control Variates for Infinite-Horizon Simulations," *Computers & Operations Research* **15** (1988), 447–456.

- B. L. Nelson, “Some Properties of Simulation Interval Estimators Under Dependence Induction,” *Operations Research Letters* **6** (1987), 169–176.
- B. L. Nelson, “A Perspective on Variance Reduction in Dynamic Simulation Experiments,” *Communications in Statistics* **B16** (1987), 385–426.
- B. L. Nelson, “On Control Variate Estimators,” *Computers & Operations Research* **14** (1987), 219–225.
- B. L. Nelson and B. Schmeiser, “Decomposition of Some Well-Known Variance Reduction Techniques,” *Journal of Statistical Computation and Simulation* **23** (1986), 183–209.
- B. L. Nelson, “An Illustration of the Sample Space Definition of Simulation and Variance Reduction,” *Transactions of the Society for Computer Simulation* **2** (1985), 237–247.
- B. L. Nelson and A. Ravindran, “A Hybrid Graphical-Simulation Analysis of a Health Systems Problem,” *Simulation* **44** (1985), 219–224.

- **Books and Book Chapters**

- B. L. Nelson “Selecting the Best Simulated System: Thinking Differently About an Old Problem,” in *International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing*, pp. 69–79, Springer, Cham (2018).
- E. Song and B. L. Nelson, “Input Model Risk,” Chapter 5 in *Advances in Modeling and Simulation—Seminal Research from 50 Years of Winter Simulation Conferences*, Springer, NY (2017).
- S. R. Hunter and B. L. Nelson, “Parallel Ranking and Selection,” Chapter 12 in *Advances in Modeling and Simulation—Seminal Research from 50 Years of Winter Simulation Conferences*, Springer, NY (2017).
- L. J. Hong, B. L. Nelson and J. Xu, “Discrete Optimization via Simulation,” Chapter 2 in *Handbook of Simulation Optimization*, Springer, NY (2015).
- B. L. Nelson, *Foundations and Methods of Stochastic Simulation: A First Course*. Springer-Verlag, NY (2013), ISBN 978-1-4614-6159-3.
- B. L. Nelson, “Optimization via Simulation over Discrete Decision Variables,” in *TutORials in Operations Research* (ed. J. J. Hasenbein) **7**, 193–207, INFORMS (2010).
- J. Banks, J. S. Carson, B. L. Nelson and D. Nicol, *Discrete-Event System Simulation*, fifth edition, Prentice Hall, Upper Saddle River, NJ (2010), ISBN 0-13-606212-1.
- E. K. Bish, F. Y. Chen, Y. T. Leong, B. L. Nelson, J. W. C. Ng and D. Simchi-Levi, “Dispatching Vehicles in a Mega Container Terminal,” in *Container Terminals and Cargo Systems: Design, Operations Management and Logistics Control Issues* (eds. K. H. Kim and H.-O. Günther), 179–194, Springer (2007).
- S. Henderson and B. L. Nelson, “Stochastic Computer Simulation,” Chapter 1 in *Elsevier Handbooks in Operations Research and Management Science: Simulation* (eds. S. G. Henderson and B. L. Nelson), Elsevier (2006).
- D. Goldsman and B. L. Nelson, “Correlation-based Methods,” Chapter 15 in *Elsevier Handbooks in Operations Research and Management Science: Simulation* (eds. S. G. Henderson and B. L. Nelson), Elsevier (2006).



S.-H. Kim and B. L. Nelson, “Selecting the Best System,” Chapter 17 in *Elsevier Handbooks in Operations Research and Management Science: Simulation* (eds. S. G. Henderson and B. L. Nelson), Elsevier (2006).

B. L. Nelson, “Statistical Analysis of Simulation Results,” Chapter 94 in *Handbook of Industrial Engineering*, third edition (G. Salvendy, ed.), John Wiley, New York (2001), 2469–2495 ISBN 0-471-33057-4.

D. Goldsman and B. L. Nelson, “Comparing Systems via Simulation,” Chapter 8 in *The Handbook of Simulation* (J. Banks, ed.), Wiley, New York (1998), 273–306, ISBN 0-471-13403-1.

B. L. Nelson. *Stochastic Modeling: Analysis and Simulation*, reprinted by Dover Publications, Inc., Mineola, NY (1995), ISBN 0-486-42569-X.

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- **Working Papers**

D. J. Eckman, M. Plumlee and B. L. Nelson, “Plausible Screening Using Functional Properties for Simulations with Large Solution Spaces,” submitted to *Operations Research*.

L. Pei, B. L. Nelson, S. R. Hunter, “Parallel Adaptive Survivor Selection,” submitted to *Operations Research*.

L. Rhodes-Leader, B. L. Nelson, B. S. Onggo and D. J. Worthington, “A Multi-Fidelity Modelling Approach for Airline Disruption Management using Simulation,” submitted to *Journal of the Operational Research Society*.

X. Jiang, B. L. Nelson and L. J. Hong, “Meaningful Sensitivities,” submitted to *IISE Transactions*.

X. Jiang, B. Biller, J. Box and B. L. Nelson, “Sensitivity Analysis in Clinical Trial Simulation at SAS Institute,” submitted to *Healthcare Management Science*.

L. E. Morgan, B. L. Nelson, A. C. Titman and D. J. Worthington, “A Spline Function Method for Modeling and Simulating a Nonhomogeneous Poisson Process,” submitted to *European Journal of Operational Research*.

- **Proceedings Papers**

D. J. Eckman, M. Plumlee and B. L. Nelson, “Revisiting Subset Selection,” *Proceedings of the 2020 Winter Simulation Conference*, in press.

L. Pei, B. L. Nelson and S. R. Hunter, “Evaluation of bi-PASS for Parallel Simulation Optimization,” *Proceedings of the 2020 Winter Simulation Conference*, in press.

G. Laidler, L. E. Morgan, B. L. Nelson and N. G. Pavlidis, “Metric Learning for Simulation Analytics,” *Proceedings of the 2020 Winter Simulation Conference*, in press.

- B. L. Nelson and L. L. Leemis, “The Ease of Fitting but Futility of Testing a Nonstationary Poisson Processes from One Sample Path,” *Proceedings of the 2020 Winter Simulation Conference*, in press.
- L. E. Morgan, B. L. Nelson, A. C. Titman and D. J. Worthington, “A Spline-based Method for Modelling and Generating a Nonhomogeneous Poisson Process,” *Proceedings of the 2019 Winter Simulation Conference*, 356–367.
- W. X. Jiang, B. L. Nelson and L. J. Hong, “Estimating Sensitivity to Input Model Variance,” *Proceedings of the 2019 Winter Simulation Conference*, 3705–3716.
- B. L. Nelson, “Selecting the Best Simulated System: Thinking Differently About an Old Problem,” *Proceedings of Monte Carlo and Quasi-Monte Carlo Methods 2018*, in press.
- M. Plumlee and B. L. Nelson, “Plausible Optima,” *Proceedings of the 2018 Winter Simulation Conference*, 467–478.
- X. W. Jiang and B. L. Nelson, “Better Input Modeling via Model Averaging,” *Proceedings of the 2018 Winter Simulation Conference*, 1575–1586.
- L. Pei, B. L. Nelson and S. R. Hunter, “A New Framework for Parallel Ranking & Selection using an Adaptive Standard,” *Proceedings of the 2018 Winter Simulation Conference*, 2201–2212.
- J. Dong, M. B. Feng and B. L. Nelson, “Unbiased Metamodeling via Likelihood Ratios,” *Proceedings of the 2018 Winter Simulation Conference*, 1778–1789.
- L. Rhodes-Leader, D. J. Worthington, B. L. Nelson and B. S. Onggo, “Multi-fidelity Simulation Optimisation for Airline Disruption Management,” *Proceedings of the 2018 Winter Simulation Conference*, 2179–2190.
- H. Ouyang and B. L. Nelson, “Simulation-based Predictive Analytics for Dynamic Queueing Systems,” *Proceedings of the 2017 Winter Simulation Conference*, 1716–1727.
- Y. Lin and B. L. Nelson, “Variance and Derivative Estimation for Virtual Performance in Simulation Analytics,” *Proceedings of the 2017 Winter Simulation Conference*, 1856–1867.
- L. E. Morgan, B. L. Nelson, A. Titman and D. J. Worthington, “Detecting Bias Due to Input Modelling in Computer Simulation,” *Proceedings of the 2017 Winter Simulation Conference*, 1974–1985.
- M. B. Semelhago, B. L. Nelson, A. Wächter and E. Song, “Computational Methods for Optimization via Simulation Using Gaussian Markov Random Fields,” *Proceedings of the 2017 Winter Simulation Conference*, 2080–2091.
- B. L. Nelson, “Technology Transfer of Simulation Analysis Methodology: One Man’s Opinion,” *Proceedings of the 2016 Winter Simulation Conference*, 248–254.
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- G. Jiang, L. J. Hong and B. L. Nelson, “A Simulation Analytics Approach to Dynamic Risk Monitoring,” *Proceedings of the 2016 Winter Simulation Conference*, 437–447.
- Y. Lin and B. L. Nelson, “Simulation Analytics for Virtual Statistics via  $k$  Nearest Neighbors,” *Proceedings of the 2016 Winter Simulation Conference*, 448–459.

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- J. S. Smith and B. L. Nelson, "Estimating and Interpreting the Waiting Time for Customers Arriving to a Non-Stationary Queueing System," *Proceedings of the 2015 Winter Simulation Conference*, 2610–2621.
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- S. Lee and B. L. Nelson, "Computational Improvements in Bootstrap Ranking & Selection Procedures via Multiple Comparison with the Best," *Proceedings of the 2015 Winter Simulation Conference*, 3758–3767.
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- W. Xie, R. R. Barton and B. L. Nelson, "Statistical Uncertainty Analysis for Stochastic Simulation with Dependent Input Models," *Proceedings of the 2014 Winter Simulation Conference*, 674–685.
- M. C. Fu, G. Bayraksan, S. G. Henderson, B. L. Nelson, W. B. Powell, I. O. Ryzhov and B. Thengvall, "Simulation Optimization: A Panel on the State of the Art in Research and Practice," *Proceedings of the 2014 Winter Simulation Conference*, 3696–3706.
- P. Salemi, B. L. Nelson and J. Staum, "Discrete Optimization via Simulation Using Gaussian Markov Random Fields," *Proceedings of the 2014 Winter Simulation Conference*, 3809–2820.
- S. Lee and B. L. Nelson, "Bootstrap Ranking and Selection," *Proceedings of the 2014 Winter Simulation Conference*, 3857–3868.
- E. Song and B. L. Nelson, "A Quicker Assessment of Input Uncertainty," *Proceedings of the 2013 Winter Simulation Conference*, 474–485.
- P. Salemi, J. Staum and B. L. Nelson, "Gaussian Markov Random Fields for Simulation Metamodeling," *Proceedings of the 2013 Winter Simulation Conference*, 543–554.
- S. J. E. Taylor, S. Brailsford, S. E. Chick, P. L'Ecuyer, C. M. Macal and B. L. Nelson, "Modeling and Simulation Grand Challenges: An OR/MS Perspective," *Proceedings of the 2013 Winter Simulation Conference*, 1269–1282.
- B. E. Ankenman and B. L. Nelson, "A Quick Assessment of Input Uncertainty," *Proceedings of the 2012 Winter Simulation Conference*, 241–250.
- P. Salemi, B. L. Nelson and J. Staum "Moving Least Squares Regression for High Dimensional Simulation Metamodeling," *Proceedings of the 2012 Winter Simulation Conference*, 292–303.
- X. Chen, K-K. Kim and B. L. Nelson, "Stochastic Kriging for Conditional Value-at-risk and its Sensitivities," *Proceedings of the 2012 Winter Simulation Conference*, 268–279.
- B. L. Nelson, "Thirty Years of 'Batch-Size Effects'," *Proceedings of the 2011 Winter Simulation Conference*, 393–400.

- M. H. Tongaralak, B. E. Ankenman and B. L. Nelson, "Relative Error Stochastic Kriging," *Proceedings of the 2011 Winter Simulation Conference*, 3628–3640.
- X. Chen, B. Ankenman and B. L. Nelson, "Common Random Numbers and Stochastic Kriging," *Proceedings of the 2010 Winter Simulation Conference*, 947–956.
- W. L. Xu and B. L. Nelson, "Empirical Stochastic Branch and Bound for Optimization via Simulation," *Proceedings of the 2010 Winter Simulation Conference*, 983–994.
- J. Bekki, B. L. Nelson and J. W. Fowler, "Bootstrapping-Based Fixed-Width Confidence Intervals for Ranking and Selection," *Proceedings of the 2010 Winter Simulation Conference*, 1024–1033.
- W. Xie, J. Staum and B. L. Nelson, "The Influence of Correlation Functions on Stochastic Kriging Metamodels," *Proceedings of the 2010 Winter Simulation Conference*, 1067–1078.
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- M. Liu, B. L. Nelson and J. Staum, "Simulation on Demand for Pricing Many Securities," *Proceedings of the 2010 Winter Simulation Conference*, 2782–2789.
- M. Liu, B. L. Nelson and J. Staum, "An Efficient Simulation Procedure for Point Estimation of Expected Shortfall," *Proceedings of the 2010 Winter Simulation Conference*, 2821–2831.
- L. J. Hong and B. L. Nelson, "A Brief Introduction to Optimization via Simulation," *2009 Winter Simulation Conference Proceedings*, 75–85.
- J. R. Wieland and B. L. Nelson, "How Simulation Languages Should Report Results: A Modest Proposal," *2009 Winter Simulation Conference Proceedings*, 709–715.
- W. K. Chan, L. W. Schruben, B. L. Nelson and S. H. Jacobson, "Simulation Fusion," *2009 Winter Simulation Conference Proceedings*, 686–695.
- B. L. Nelson and I. Gerhardt, "Modeling and Simulating Non-Poisson Arrival Processes to Facilitate Analysis," *Proceedings of the 2009 INFORMS Simulation Society Workshop*, 6–8.
- B. E. Ankenman, B. L. Nelson and J. Staum, "Stochastic Kriging for Simulation Metamodeling," *2008 Winter Simulation Conference Proceedings*, 362–370.
- B. L. Nelson, "The MORE Plot: Displaying Measures Of Risk & Error from Simulation Output," *2008 Winter Simulation Conference Proceedings*, 413–416.
- M. H. Tongaralak, B. Ankenman, B. L. Nelson, L. Borne and K. Wolfe, "Using Simulation Early in the Design of a Fuel Injector Production Line," *2008 Winter Simulation Conference Proceedings*, 471–478.
- E. Baysal, B. L. Nelson and J. Staum, "Response Surface Methodology for Simulating Hedging and Trading Strategies," *2008 Winter Simulation Conference Proceedings*, 629–637.
- J. Smith, J. Hamilton, B. L. Nelson, L. Schruben, R. Nance and G. F. Riley, "What Makes Good Research in Modeling and Simulation: Assessing the Quality, Success, and Utility of M&S Research," *2008 Winter Simulation Conference Proceedings*, 689–694.
- S. Kim and B. L. Nelson, "Recent Advances in Ranking and Selection," *2007 Winter Simulation Conference Proceedings*, 162–172.

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- D. Goldsman, J. O. Henriksen, P. L'Ecuyer, B. L. Nelson, D. H. Withers and N. T. Argon, "Fortieth Anniversary Special Panel: Landmark Papers," *2007 Winter Simulation Conference Proceedings*, 2–13.
- H. Lan, B. L. Nelson and J. Staum, "A Confidence Interval for Tail Conditional Expectation via Two-Level Simulation," *2007 Winter Simulation Conference Proceedings*, 949–957.
- H. Lan, B. L. Nelson and J. Staum, "Two-Level Simulations for Risk Management," *Proceedings of the 2007 INFORMS Simulation Society Workshop*, 102–107.
- V. Lesnevski, B. L. Nelson, and J. Staum, "An Adaptive Procedure for Estimating Coherent Risk Measures Based on Generalized Scenarios." *2006 Winter Simulation Conference Proceedings*, 348–355.
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- L. J. Hong and B. L. Nelson, "An Indifference-Zone Selection Procedure with Minimum Switching and Sequential Sampling," *2003 Winter Simulation Conference Proceedings*, 474–480.
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- H. Wan, B. E. Ankenman and B. L. Nelson, "Controlled Sequential Bifurcation: A New Factor-Screening Method for Discrete-Event Simulation," *2003 Winter Simulation Conference Proceedings*, 565–573.
- B. Biller and B. L. Nelson, "Answers to the Top Ten Input Modeling Questions," *2002 Winter Simulation Conference Proceedings*, 35–40.
- B. Biller and B. L. Nelson, "Parameter Estimation for ARTA Processes," *2002 Winter Simulation Conference Proceedings*, 255–262.
- J. Pichitlamken and B. L. Nelson, "A Combined Procedure for Optimization via Simulation," *2002 Winter Simulation Conference Proceedings*, 292–300.
- M. Rosenshine, R. R. Barton, D. Goldsman, L. M. Leemis and B. L. Nelson, "Using Simulation to Teach Probability—Words and Deeds," *2002 Winter Simulation Conference Proceedings*, 1815–1822.
- B. Deler and B. L. Nelson, "Modeling and Generating Multivariate Time Series with Arbitrary Marginals and Autocorrelation Structures," *2001 Winter Simulation Conference Proceedings*, 275–282.
- J. Pichitlamken and B. L. Nelson, "Selection-of-the-best Procedures for Optimization via Simulation," *2001 Winter Simulation Conference Proceedings*, 401–407.
- D. Goldsman and B. L. Nelson, "Statistical Selection of the Best System," *2001 Winter Simulation Conference Proceedings*, 139–146.
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- D. Goldsman and B. L. Nelson, "Statistical Screening, Selection, and Multiple Comparison Procedures in Computer Simulation," *1998 Winter Simulation Conference Proceedings*, 159–166.
- B. L. Nelson and M. Yamnitsky, "Input Modeling Tools for Complex Problems," *1998 Winter Simulation Conference Proceedings*, 105–112.

- J. Boesel and B. L. Nelson, "Accounting for Randomness in Heuristic Simulation Optimization," *Proceedings of the 12th European Simulation Multiconference* (ed. R. Zobel and D. Moeller), Society for Computer Simulation International, 634–638.
- J. O. Miller, B. L. Nelson and C. H. Reilly, "Getting More From the Data in a Multinomial Selection Problem," *1996 Winter Simulation Conference Proceedings*, 287–294.
- P. P. Ware, T. W. Page and B. L. Nelson, "Modeling File-System Input Traces via a Two-Level Arrival Process," *1996 Winter Simulation Conference Proceedings*, 1230–1237.
- B. L. Nelson, W. S. Keezer and T. F. Schuppe, "A Hybrid Simulation-Queueing Module for Modeling UNIX I/O in Performance Analysis," *1996 Winter Simulation Conference Proceedings*, 1239–1246.
- B. L. Nelson, P. Ware, M. C. Cario, C. A. Harris, S. A. Jamison, J. O. Miller, J. Steinbugl and J. Yang, "Input Modeling when Simple Models Fail," *1995 Winter Simulation Conference Proceedings*, 93–100.
- F. J. Matejcek and B. L. Nelson, "One-Stage Multiple Comparisons with the Best for Unequal Variances," *Proceedings of the Business and Economics Section of the American Statistical Association* (1994), 55–60.
- Y-H. Tao and B. L. Nelson, "A Conceptual Framework for Simulation Experiment Design and Analysis," *1994 Winter Simulation Conference Proceedings*, 681–688.
- D. Goldsman and B. L. Nelson, "Ranking, Selection and Multiple Comparisons in Computer Simulation," *1994 Winter Simulation Conference Proceedings*, 192–199.
- F. J. Matejcek and B. L. Nelson, "Simultaneous Ranking, Selection and Multiple Comparisons for Computer Simulation," *1993 Winter Simulation Conference Proceedings*, 386–392.
- B. L. Nelson, "Common Random Numbers and Multiple Comparisons in Simulation Analysis," *Proceedings of the 1st Industrial Engineering Research Conference* (1992), 463–466.
- W. S. Keezer, A. P. Fenic and B. L. Nelson, "Representation of User Transaction Processing Behavior with a State Transition Matrix," *1992 Winter Simulation Conference Proceedings*, 1223–1231.
- B. L. Nelson, "Designing Efficient Simulation Experiments," *1992 Winter Simulation Conference Proceedings*, 126–132.
- C. Cash, B. L. Nelson, J. Long, D. Dippold and W. Pollard, "Evaluation of Tests for Initial-Condition Bias," *1992 Winter Simulation Conference Proceedings*, 577–585.
- D. Goldsman, B. L. Nelson and B. Schmeiser, "Methods for Selecting the Best System," *1991 Winter Simulation Conference Proceedings*, 177–186.
- L. Goldsman and B. L. Nelson, "Batch-Size Effects on Simulation Optimization using Multiple Comparisons with the Best," *1990 Winter Simulation Conference Proceedings*, 288–293.
- W. Yang and B. L. Nelson, "Optimization using Common Random Numbers, Control Variates and Multiple Comparisons with the Best," *1989 Winter Simulation Conference Proceedings*, 444–449.
- J. C. Hsu and B. L. Nelson, "Optimization over a Finite Number of System Designs with One-Stage Sampling and Multiple Comparisons with the Best," *1988 Winter Simulation Conference Proceedings*, 451–457.

- W. Yang and B. L. Nelson, “Multivariate Estimation and Variance Reduction in Terminating and Steady-State Simulation,” *1988 Winter Simulation Conference Proceedings*, 466–472.
- B. L. Nelson, “Variance Reduction for Simulation Practitioners,” *1987 Winter Simulation Conference Proceedings*, 43–51.
- J. C. Hsu and B. L. Nelson, “Control Variates for Quantile Estimation,” *1987 Winter Simulation Conference Proceedings*, 434–444.
- R. Añonuevo and B. L. Nelson, “Automated Estimation and Variance Reduction for Steady-State Simulations,” *1986 Winter Simulation Conference Proceedings*, 871–875.
- B. L. Nelson, “Variance Reduction in Computer Simulation,” *1986 International Industrial Engineering Conference Proceedings*, 295–303.
- B. L. Nelson, “A Decomposition Approach to Variance Reduction,” *1985 Winter Simulation Conference Proceedings*, 23–32.
- B. L. Nelson and B. Schmeiser, “Variance Reduction: Basic Transformations,” *1983 Winter Simulation Conference Proceedings*, 225–258.

- **Newsletter Articles**

- B. L. Nelson, “Rockford Powertrain,” *Manufacturing Matters*, Northwestern University (Winter 1997).
- B. L. Nelson, “Simulation in ISE,” *Department of Industrial & Systems Engineering Newsletter*, The Ohio State University (Summer 1988), pp. 1–2.
- B. L. Nelson, “Simulation Languages Available at OSU,” *The OSU Statistician* **2** (1987), pp. 5–6.
- B. L. Nelson, “The Sample Variance of Antithetic Variates,” *TIMS College on Simulation Newsletter* **9** (1985), p. 7.
- B. L. Nelson, “Member’s Corner – Using Gambling to Teach Simulation,” *I-Sim News* **19**, 1, (2005), p. 12.

- **Sponsored Research**

- “Mobility as a Service Network Simulation,” General Motors Corporation (2020).
- “Adaptive Gaussian Markov Random Fields for Large-scale Discrete Optimization via Simulation,” National Science Foundation Grant No. DMS-1854562 (2019–2022).
- “Green Simulation,” National Science Foundation Grant No. CMMI-1634982 (2017–2019).
- “Quantifying the Uncertainty Propagation in Vehicle Content Packaging and Pricing Optimization,” General Motors Corporation (2016).
- “GOALI: Simulation Analytics,” National Science Foundation Grant No. CMMI-1537060 (2015–2019).
- “Simulation Analytics,” Undergraduate Research Assistant Program Grant No. 999URAP136717, Northwestern University (Summer 2015).
- “GOALI: Quantifying Input Uncertainty in Stochastic Simulation,” National Science Foundation Grant No. CMMI-1068473 (2011–2014).



“Stochastic Kriging: Modeling and Controlling Uncertainty in Simulation,” National Science Foundation Grant No. CMMI-0900354 (2009–2012), with B. Ankenman and J. Staum.

“Fuel Injector Production Line Simulation for Delphi,” Delphi Corporation (2008), with B. Ankenman.

“Design and Implementation of VBAsim,” The Alumnae of Northwestern University (2008–2009).

“Strategic Decision Making Support over the Manufacturing Life Cycle,” General Motors R&D Center (2006–2009), with W. Hopp.

“Simulating Coherent Risk Measures,” National Science Foundation Grant No. DMI-0555485 (2006–2009), with J. Staum.

“QNATS - The Queueing Network Approximator for Time-Dependent Systems,” National Science Foundation Grant No. DMI-0521857 (2005–2008), with M. R. Taaffe.

“Multi-product Cycle Time and Throughput Evaluation via Simulation on Demand,” Semiconductor Research Corporation Grant 1224 (2004–2007), with B. Ankenman, J. Fowler and G. Mackulak.

“A Framework for Effective Optimization via Simulation,” National Science Foundation Grant No. DMI-0217690 (2002–2006), with S. Andradóttir.

“Procedures for Efficient Cycle Time-Throughput Curve Generation,” National Science Foundation Grant No. DMI-0140385 (2002–2004), with B. Ankenman, J. Fowler and G. Mackulak.

“A Simulation Design and Analysis Environment for GM,” General Motors R&D Center (2002–2004), with B. Ankenman.

“Resource Requirements for Demand-Responsive Transportation Services,” Transportation Cooperative Research Program (2000-2002), with J. Schofer.

“A Simulation Framework for Vehicle Distribution Systems,” General Motors R&D Center (2000-2001).

“Advanced Information Technologies on ERP, MES, APS and SCM,” JGC Corporation, Japan (1999–2000), with M. Daskin.

“A Comprehensive Framework and Software for Simulation Input Modeling,” National Science Foundation Grant No. DMI-9821011 (1999–2001), with J. R. Wilson.

“Comparisons via Stochastic Simulation, with Applications to Manufacturing and Services,” National Science Foundation Grant No. DMI-9622065 (1996–2000), with D. Goldsman.

“Scenario Generation and Evaluation via Discrete-Event Simulation,” JGC Corporation, Japan (1996–1998).

“Mathematical Analysis of AGV Deployment and Routing,” Port of Singapore Authority (1996–1997), with David Simch-Levi (PI).

“Production Planning and Control for Rockford Powertrain,” Rockford Powertrain, Rockford, IL (1996–1997).

“Monte Carlo Evaluation of Multiple Comparison Procedures Used in Computer Simulation Experiments,” Ohio Supercomputer Center Grant #PAS811-1 (1993).

“Multiple Comparisons for Optimization via Simulation,” National Science Foundation Grant No. DDM-8922721 (1990–1994), with J. C. Hsu.

“Analysis of Equipment Sequencing and Tracking Systems for Switching Manufacturing at AT&T Columbus,” AT&T-Ohio State Task Order Agreement (1991), with C. H. Reilly.

“Combined Variance Reduction and Output Analysis in Stochastic Simulation,” National Science Foundation Grant No. ESC-8707634 (1987–1989).

“Toward Algorithmic Application of Variance Reduction in Simulation Experiments,” Office of Research and Graduate Studies, The Ohio State University (1985–1986).

- **Professional Affiliations**

Association for Computing Machinery

American Statistical Association

Institute of Industrial Engineers (Fellow)

Institute for Operations Research and the Management Sciences (Fellow)

Omega Rho

- **Research Awards**

2019 David F. Baker Distinguished Research Award from the Institute of Industrial and Systems Engineers.

Honorable Mention, Best Theory Paper 2019 Winter Simulation Conference, for Morgan, et al. “A Spline-based Method for Modelling and Generating a Nonhomogeneous Poisson Process.”

2015 Outstanding Simulation Publication Award from the INFORMS Simulation Society for the papers “A Bayesian Framework for Quantifying Uncertainty in Stochastic Simulation,” *Operations Research* **62** (2014), 1439–1452, and “Quantifying Input Uncertainty via Simulation Confidence Intervals,” *INFORMS Journal on Computing* **26** (2014), 74–87, both with W. Xie and R. R. Barton.

Best paper, Operations, of *IIE Transactions* for “Empirical Stochastic Branch and Bound for Optimization via Simulation,” *IIE Transactions* **45** (2013) 685–698, with W. L. Lu.

2013 Outstanding Simulation Publication Award from the INFORMS Simulation Society for the paper “Stochastic Kriging for Simulation Metamodeling,” *Operations Research* **58** (2010), 371–382, with B. E. Ankenman and J. Staum.

Best paper, Operations, of *IIE Transactions* for “Fully Sequential Selection Procedures with Control Variates,” *IIE Transactions* **42** (2009), 71–82, with S. C. Tsai.

Best paper, Operations, of *IIE Transactions* for “Selecting the Best System when Systems are Revealed Sequentially,” *IIE Transactions*, **39** (2007), 723–734, with L. J. Hong.

“Methods for Selecting the Best System,” *Proceedings of the 1991 Winter Simulation Conference*, 177–186, selected as one of 10 Landmark Papers from the first 40 years of the conference.

2006 Outstanding Simulation Publication Award from the INFORMS Simulation Society for the paper “Using Ranking & Selection to ‘Clean Up’ after Simulation Optimization,” *Operations Research* **51** (2003), 814–825, with J. Boesel and S.-H. Kim.

Research Award, Operations Research Division of IIE (1997). This is a career research award.  
First Place, Institute of Industrial Engineers Graduate Research Award (1982).

- **Teaching Awards**

IIE Modeling & Simulation Division Award for Excellence in Teaching (2019).

McCormick School of Engineering and Applied Sciences Teacher of the Year Award, Northwestern University (1997-1998, 2006–2007).

IIE Operations Research Division Award for Excellence in the Teaching of Operations Research (2004).

Northwestern Alumni Association Excellence in Teaching Award (2003).

ASG Faculty Honor Roll, Northwestern University (2002, 2003, 2007).

Senior Choice Award: Outstanding Professor, given by the IEMS Senior Class of 2001.

Graduate Teaching Award, Student INFORMS Chapter, Department of Industrial Engineering and Management Sciences, Northwestern University (1995–1996, 1996–1997, 1997–1998, 1999–2000, 2000–2001, 2002–2003, 2005–2006, 2006–2007, 2012–2013).

Honorable mention, McCormick School of Engineering and Applied Sciences Teacher of the Year Award, Northwestern University (1996-97).

Alumni Award for Distinguished Teaching, a university-wide award from The Ohio State University (1994). This is the highest award for teaching given by the university; includes induction into the OSU Academy of Teaching.

Charles E. MacQuigg Award for Outstanding Teaching, a college-wide award from the College of Engineering, The Ohio State University (1992).

Alpha Pi Mu Outstanding Faculty Award, voted by the Department of Industrial and Systems Engineering seniors, The Ohio State University (1989, 1995).

- **Other Honors and Awards**

Fellow, Institute of Industrial Engineers (2011).

Fellow, Institute for Operations Research and the Management Sciences (2005).

McCormick Excellence Award, Robert R. McCormick School of Engineering and Applied Science (2006).

INFORMS College on Simulation Distinguished Service Award (2003).

General Electric Graduate Fellowship (1981–1982).

Purdue University Graduate Fellowship (1979–1981).

B.A. Summa Cum Laude, Phi Beta Kappa (1979).

- **Invited Presentations**

**Plenary Lectures**

Keynote Lecture, INFORMS Annual Meeting, November 2020.

Plenary Lecture, 13th International Conference in Monte Carlo & Quasi-Monte Carlo Methods in Scientific Computing, Rennes, France, July 2018.

Alan B. Pritsker Scholars Distinguished Lecture, Purdue University, April 2018.

Keynote address, Winter Simulation Conference, December 2017.

Keynote address, Operations Research Society 7th Simulation Workshop, Worcestershire, England, April 2014.

Titans of Simulation Lecture, Winter Simulation Conference, December 2013.

Omega Rho Distinguished Lecture, INFORMS Annual Meeting, November 2011.

Keynote speaker, Asian Simulation and Modeling Conference, Bangkok, Thailand, January 2009.

Keynote speaker, IIE Annual Conference and Expo, Vancouver, Canada, May 2008.

Plenary speaker, 2007 INFORMS Simulation Society Workshop, Fontainebleau, France, July 2007.

Keynote speaker, International Workshop on Mathematical Methods and Tools in Computer Simulation, St. Petersburg, Russia, May 1994.

**U.S. Universities**

Air Force Institute of Technology, Arizona State, Arkansas, Auburn, Carnegie Mellon, Central Florida, Cornell, DePauw, Georgia Tech, Illinois, Iowa State, Maryland, Michigan, Minnesota, Missouri University of Science & Technology, MIT, Naval Postgraduate School, North Carolina State, Northeastern, Northwestern, Ohio State, Oklahoma State, Penn State, Pittsburgh, Purdue, Rochester Institute of Technology, Virginia Tech, Texas A&M, Texas-Austin, Wisconsin-Madison

**International Universities**

Cambridge (England), Lancaster (England), Loughborough (England), Southampton (England), Chinese University of Hong Kong, City University of Hong Kong, Hong Kong University of Science & Technology, Hong Kong Polytechnic University, Vrije Universiteit Amsterdam (Netherlands), Tilburg (Netherlands), Université de Montréal (Canada), INSEAD (France), Dagstuhl (Germany), Shanghai Jiao Tong (China), Asian Institute of Technology (Thailand), Chulalongkorn (Thailand), Kasetsart (Thailand)

**Non-academic**

General Motors R&D, MITRE Corporation, Norwegian Defense Establishment, SAS Institute, Simio LLC

- **National and International Service (selected)**

Member, Philip McCord Morse Distinguished Lecturership Award Selection Committee of INFORMS (2019).

Member, *Operations Research* Editor-in-Chief selection committee (2017).

Member, NSF Sponsored Working Group on Operations Research Response to the NAE Grand Challenges (2012–2013).

Vice-President (2010–2011), President (2012–present) of the Association of Chairs of Operations Research Departments (ACORD).

Co-organizer, “Accelerating Industrial Productivity via Deterministic Computer Experiments and Stochastic Simulation Experiments,” Isaac Newton Institute for Mathematical Sciences, September 5–9, 2011.

Trustee, Winter Simulation Conference Foundation (2008–2012).

Co-organizer, NSF Workshop on Simulation Optimization, May 24–25, 2010.

Area Editor, *Surveys in Operations Research and Management Science* (2009–2011).

Editor-in-Chief, *Naval Research Logistics* (2006–2008).

External reviewer for Department of Management Science and Engineering, Stanford (2017), Department of Industrial and Manufacturing Engineering, Penn State (2013); Operations Research and Industrial Engineering Program, Texas-Austin (2013); Mathematics Department, College of William & Mary (2009); Department of Operational Sciences, Air Force Institute of Technology (2008).

Board Member representing INFORMS, Winter Simulation Conference Board of Directors (2000–2007).

Past Simulation Area Editor for *Operations Research*; past Associate Editor for *ACM Transactions on Modeling and Computer Simulation*; past Associate Editor for *Naval Research Logistics* and *Operations Research*.

Program Chair, 1997 Winter Simulation Conference; Associate Program Chair, 1996 Winter Simulation Conference; Track Coordinator, 1993 Winter Simulation Conference; Proceedings Editor, 1991 Winter Simulation Conference; Publicity Chair, 1989 Winter Simulation Conference.

President (1992–1994), Vice-President (1990–1992), Secretary-Treasurer (1988–90) and *Newsletter* Editor (1986–1988) of The Institute of Management Sciences College on Simulation (now INFORMS Simulation Society).

National Science Foundation review panel (1990, 1992, 2000, 2001, 2003, 2004, 2009, 2010, 2012); proposal reviewer for the National Science Foundation (1987, 1989, 1990, 1991, 1996).

INFORMS Simulation Society Lifetime Professional Achievement Award Committee (2011–present), INFORMS Simulation Society Outstanding Publication Committee (2002–2004), INFORMS Simulation Society Outstanding Service Award Committee (2005–2007), INFORMS Impact Prize Committee (2004). Nicholson Prize Committee (1996).

Book reviewer for *Journal of the American Statistical Association* **84**, p. 334 (1989).

Book reviewer for *Journal of Quality Technology* **21**, p. 291–292 (1989).

Book reviewer for Macmillan, Addison-Wesley, McGraw-Hill and West Educational Publishing, and Princeton University Press.

- **Local Service Northwestern (selected)**

Client Project Challenge Committee (2017–2019).  
Director of Graduate Studies (2016–2017).  
MMM Director search committee member, 2009–2010.  
Chair, Patterson Chair in Transportation search committee (2006–2007)  
Program Review Subcommittee member (2006)  
McCormick Promotion and Tenure Committee (2001–2008, 2016–2017)  
IEMS Steering Committee (2002–2007)  
IEMS Strategic Planning Committee (2003–2004)  
Director, Master of Engineering Management Program (1998–2007)  
MEAS Future Planning Committee member (1997–1999)  
MEAS Engineering First Committee member (1995–1997)  
IEMS Undergraduate Curriculum Committee member (1995–1998)  
IEMS Graduate Committee member (1996–2002)  
IEMS Program Review Committee Chair (1996–1997)

- **Local Service Ohio State (selected)**

Graduate Studies Co-chair, Department of Industrial, Welding and Systems Engineering (1994–1995).  
Consolidated Chair Search Committee, Department of Industrial, Welding and Systems Engineering (1994).  
College of Engineering Computing Committee (1992–1993).  
Department of Industrial and Systems Engineering Nominating Committee for Promotion and Tenure (1990, 1991, 1993).  
Chair, Department of Industrial and Systems Engineering Computing Committee (1990–1991).  
Chair, Department of Industrial and Systems Engineering Self-Study Committee for Program Review (1988–1990).  
Chair, Department of Industrial and Systems Engineering Seminar Series (1987–1988).  
Department representative for Graduate and Professional Schools Visitation Day for Minority Students (1985).

- **Graduate and Undergraduate Student Advising**

- Ph.D.s and Postdocs (placement)**

- Mark Semelhago, “Computational Aspects of Discrete Optimization via Simulation with Gaussian Markov Random Fields,” Fall 2020 (Amazon).  
Xi Jiang, “Reducing and Measuring Input Model Risk in Stochastic Simulation,” Fall 2020 (SAS Institute).

Lucy Morgan, “Quantifying and Reducing Input Modelling Error in Simulation,” Fall 2018 (Lancaster University).

Huiyin Ouyang (postdoc), Summer 2017 (University of Hong Kong).

Eunhye Song, “Incorporating Input Model Risk in Simulation Optimization and Uncertainty Quantification,” Spring 2017 (Penn State University).

Yujing Lin, “Simulation Analytics for Input Uncertainty & Virtual Statistics,” Spring 2017 (Amazon Research).

Wei Xie, “Statistical Uncertainty Analysis for Stochastic Simulation,” Spring 2014 (North-eastern University).

Peter Salemi, “Gaussian Markov Random Fields and Moving Least Squares for Metamodeling and Optimization in Stochastic Simulation,” Summer 2014 (MITRE Corporation).

Xi Chen, “Enhancing Stochastic Kriging Metamodels for Computer Simulation,” Summer 2012 (Virginia Tech).

Mustafa Tongarlak, “Design of Experiments and Metamodeling for Stochastic Simulation,” Winter 2011 (Bogazici University, Turkey).

Soonhui Lee, “Modeling Issues and Algorithms for a Class of Optimization Problems and Improving Fleet Utilization for Carriers,” Fall 2011 (Hankuk University of Foreign Studies, South Korea).

Ming Liu, “Efficient Simulation in Financial Risk Management,” Summer 2010 (Magnetar).

Hai Lan, “Two-Level Simulation of Expected Shortfall: Confidence Intervals, Efficient Simulation Procedures, and High-Performance Computing,” Summer 2010 (Shanghai Jiaotong University, China).

Jie Xu, “Flexibility, Lifecycle Planning and Simulation-based Optimization in Integrated Supply Chains,” Fall 2009 (George Mason University).

Wendy L. Xu, “Flexibility, Lifecycle Planning and Simulation-based Optimization in Integrated Supply Chains,” Fall 2009 (ExxonMobil R&D).

Ira Gerhardt, “Stochastic Modeling and Simulation of Nonstationary Queueing Networks Using Markovian Processes,” Spring 2009 (Manhattan College).

Shing Chih Tsai, “Control-Variate Methods for Selecting the Best Simulated System,” Summer 2007 (National Cheng Kung University, Taiwan).

Feng Yang, “Efficient Generation of Cycle-Time Throughput Curves via Simulation for Manufacturing,” Spring 2006 (West Virginia University).

Hong Wan, “Simulation Factor Screening with Controlled Sequential Bifurcation,” Summer 2004 (*Third Place Pritsker Dissertation Award from IIE*, North Carolina State University).

L. Jeff Hong, “Discrete Optimization via Simulation: Algorithms and Error Control,” Spring 2004 (Fudan University, China).

Juta Pichitlamken, “A Combined Procedure for Optimization via Simulation,” Spring 2002 (*Honorable mention Dantzig Award from INFORMS*, Kasetsart University, Thailand).

Bahar Biller, “A Comprehensive Input-Modeling Framework and Software for Stochastic, Discrete-Event Simulation Experiments,” Summer 2002 (Carnegie Mellon University).

Seong-hee Kim, “Highly Efficient Selection Procedures for Computer Simulation,” Spring 2001 (Georgia Tech).

Justin Boesel, “Search and Selection for Large-Scale Stochastic Optimization,” Spring 1999 (*Dantzig Award winning dissertation from INFORMS*, MITRE Corporation).

J. O. Miller, “Efficient Multinomial Selection in Simulation,” Winter 1997 (Air Force Institute of Technology).

Marne C. Cario, “Modeling and Generating Dependent Inputs for Discrete-Event Simulation,” Spring 1996 (Delphi Packard Electric Systems).

Yu-Hui Tao, “A Framework for Computer-Assisted Simulation Experiment Design and Analysis,” Summer 1995 (National University of Kaohsiung, Taiwan).

Frank J. Matejcik, “Heteroscedastic Multiple Comparison Procedures for Computer Simulation,” Autumn 1992 (South Dakota School of Mines and Technology).

Mingjian Yuan, “Time-Series-Analysis Methods for a Single System and Multiple Comparisons in Steady-State Simulation,” Autumn 1991 (National Yuanlin Institute of Technology, Taiwan).

Wei-Ning Yang, “Multivariate Estimation and Variance Reduction for Terminating and Steady-State Simulation,” Summer 1989 (National Taiwan Institute of Technology, Taiwan).

### **M. S. (thesis) Students**

Anthony Sharon, “The Effectiveness of Jackson Networks as Control Variates for Queueing Network Simulation,” Winter 1986.

Rowena Añonuevo, “Automated Estimation and Variance Reduction via Control Variates for SIMSCRIPT II.5 Simulations,” Autumn 1987.

Mingjian Yuan, “Efficient Closed-Queueing Network Simulation Using CAN-Q Control Variates and Stochastic Initialization,” Spring 1987.

Yu-Hui Tao, “A Standard Simulation Test Bed for Testing Simulation Procedures,” Spring 1989.

Lynne Goldsman, “Batching Strategies for Multiple Comparisons in Steady State Simulation,” Spring 1990.

### **Senior Honors Thesis Students**

Donald P. Warsing, “Generation of Acceptance Sampling Plans for Time-Dependent Processes,” Spring 1989.

J. David Dittmann, “Evaluation of Heteroscedastic Multiple Comparison Procedures,” Winter 1995.

Jamie Wieland, “Odds-Ratio Indifference-Zone Selection Procedures for Bernoulli Populations,” Spring 2001.

Carl Allen, “The Impact of Network Topology On Rational-Function Models of the Cycle Time-Throughput Curve,” Spring 2004.

Yixian (Amy) Wang, “Myths of STEM Major Shortage: How Does Secondary Education Impact Students’ Choice of Graduating Majors?” Spring 2020.

## • **Courses Taught**

### – **Northwestern University**

**IEMS 304** Statistical Methods for Data Mining



- IEMS 315** Stochastic Models and Simulation
- IEMS 317** Discrete-Event Systems Simulation
- IEMS 435** Introduction to Stochastic Simulation
- IEMS 415** Computer Simulation for Risk and Operations Analysis
- IEMS 460-1** Stochastic Models I
- IEMS 465** Simulation Design and Analysis
- IEMS 490** Optimization via Simulation
- **City University of Hong Kong**
  - A Graduate-Level Introduction to Stochastic Simulation, October 2014.
- **Lancaster University**
  - Masterclass** Experiment Design & Analysis for Dynamic, Stochastic Simulation, December 2012, March 2015, March 2016, March 2017, March 2018
  - STOR 606** Stochastic Simulation, Fall 2019, Fall 2020
- **The Ohio State University**
  - IND ENG 513** Applied Waiting Line Analysis
  - IND ENG 534** Principles of Industrial Engineering
  - IND ENG 554** Introduction to Discrete System Simulation (undergraduate)
  - IND ENG 703** Stochastic Processes Used in Systems Engineering I
  - IND ENG 704** Introduction to Discrete System Simulation (graduate)
  - IND ENG 814** Stochastic Processes Used in Systems Engineering II
  - IND ENG 843** Operations Research II
  - IND ENG 854** Advanced Simulation Design and Experimental Procedure
  - IND ENG 881** Seminar in Industrial Engineering
  - IND ENG 900.03** Seminar in Operations Research: Statistical Methods and Analysis of Statistical Methods for Dynamic Simulation
  - IND ENG 900.03** Seminar in Operations Research: Input Modeling
- **University of Minnesota**
  - SciC 8003** Modeling, Optimization and Statistics
- **Purdue University**
  - IE 190** Introduction to Industrial Engineering
  - IE 230** Statistical Control I
  - IE 231** Computers and Computer Methods
- **Indiana Vocational-Technical College**
  - STATISTICS 8210** Introduction to Statistics