Stefan Steiner

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RESEARCH INTERESTS

Industrial Statistics, Quality Improvement Systems, Experimental Design, Statistical Process Monitoring, Monitoring Medical Outcomes, Measurement System Assessment, Data Science, Experiments on Networks

ACADEMIC BACKGROUND

Ph. D. Business Administration (Management Science/Systems)
McMaster University, June 1994
Thesis: Quality Control and Improvement Based on Grouped Data

M. Sc. Applied Mathematics
University of British Columbia, August 1989
Thesis: Computer Simulation of Grace Hospital

BMATH Honours Applied Mathematics with Computer Science Minor
University of Waterloo, May 1987, Graduated on the Dean's Honour Roll

ACADEMIC WORK HISTORY

Full Professor, Department of Statistics and Actuarial Sciences, University of Waterloo, 2010-present
Chair, Statistics and Actuarial Sciences Department, University of Waterloo, July 1, 2014-June 30, 2022.
Associate Chair Undergraduate Studies, Department of Statistics and Actuarial Sciences, University of Waterloo, Sept. 2005-August 2008 and July 2009-June 2012.
Associate Professor, Department of Statistics and Actuarial Sciences, University of Waterloo, 2001-2010
Assistant Professor, Department of Statistics and Actuarial Sciences, University of Waterloo, Jan. 1995-2000
Director, Business and Industrial Statistics Research Group, University of Waterloo, Jan. 2005-June 2020
Director, Institute for Improvement in Quality and Productivity, University of Waterloo, May 2003-Dec. 2004

Visiting Professor, Department of Statistics and Actuarial Science, Simon Fraser University, Oct. 2022 – Dec. 2022
Visiting Professor, Institute for Business and Industrial Statistics, Faculty of Business, University of Amsterdam, Netherlands, Sept. 2012-July 2013
Visiting Fellow, School of Mathematical Sciences, Queensland University of Technology, Australia, Sept. 2008-July 2009
Visiting Fellow, Dept. of Statistics, University of Auckland, New Zealand, May 2002–April 2003

AWARDS

San Antonio Chapter of the American Statistical Association's **Donald B. Owen Award** 2021 for a statistician who has excelled in the areas of research, statistical consultation, and service to the statistical community.
American Society for Quality's **Brumbaugh Award** for the 2016 paper that has made the largest single contribution to the development of industrial application of quality control for Steiner SH**, Lu Y,** Mackay RJ (2016) "Assessing Binary Measurement Systems and Inspection Protocols Utilizing Follow-up Data," *Quality Engineering*, 28, 329-336.

Watfactory, my virtual manufacturing process teaching tool, was shortlisted for the **Reimagine Education award** for Digital Content, Dec. 2016.

Fellow of the American Statistical Association (ASA), 2014

Fellow of the American Society for Quality (ASQ), 2012

Statistics Division of the American Society for Quality's **Lloyd Nelson Award** for the article having the greatest immediate impact to practitioners 2014 for Jones-Farmer A, Woodall W, Steiner SH and Champ CW (2014), "An Overview of Phase I Analysis for Process Improvement and Monitoring" *Journal of Quality Technology*, 46, 265-280.

American Statistical Association's **W.J. Youden Award** in Interlaboratory Testing 2010 for **Browne R**, Steiner SH, Mackay RJ (2010) "Leveraged Gauge R&R Studies," *Technometrics*, 52, 294-302.

American Society for Quality's **Wilcoxon Prize** for the best practical applications paper published in Technometrics in 2004 for Steiner SH and Mackay RJ (2004) "Scale Counting", *Technometrics*, 46, 348-354.

RESEARCH GRANTS

Flood Impacts, Carbon Pricing, and Ecosystem Sustainability (FINCAPES) Project, Principal Investigator, funded by Global Affairs Canada (GAC) $15,000,000 for January/23-December/27.

CANSSI Collaborative Research Team Project, co-investigator (PI Aurelie Labbe), "Statistical tools for spatio-temporal sensor-based traffic data," $210,000, April 2023-March 2026,

Natural Science and Engineering Research Council of Canada (NSERC) Individual Discovery Grant $34,000/year, April/17-March/23.

Risk Management, Economic Sustainability and Actuarial Science Development in Indonesia (READI) Project, Principal Investigator (from Feb. 2016), funded by Global Affairs Canada (GAC) $15,100,000 for October/15-December/21.

Natural Science and Engineering Research Council of Canada (NSERC) Connect 2 Grant, $2,850, April 2018.

Natural Science and Engineering Research Council of Canada (NSERC) Individual Discovery Grant $24,000/year, April/12-March/17.

NSERC Individual Discovery Grant $20,000/year, April/06-March/12.

University of Waterloo, Learning Initiative Funds Grant, $11,500, June 2006.

NSERC Individual Research Grant $26,500/year, April/00-March/06.

NSERC Collaborative Research and Development (CRD) Grant (with Jerry Lawless as principal investigator): $54,000/year for the period April/99-March/02.

NSERC Individual Research Grant $21,000/year ($23,100/year for last two years), April/96-March/00.

NSERC Equipment Grant (co-applicant) $48,000, April/96.

Manufacturing Research Council of Ontario (MRCO) Research Grant (with Jerry Lawless as principal investigator) $30,000, Jan/96-Dec/96.

University of Waterloo, Mathematics Academic Development Fund $5,000, Sept/95.

University of Waterloo President's NSERC Award $5,000, Jan/95.

SUPERVISION OF GRADUATE STUDENTS

I am currently supervising the following students:

Adel Nadi, Statistics PostDoc (joint with Nathaniel Stevens), started May 1, 2022, topic: Analysis of Streaming Data.

Mahsa Panahi, Statistics PhD (joint with Jeroen de Mast), started September 2019, topic: Statistical Methods in the Search for a Dominant Cause of Variation

Trang Bui, Statistics PhD (joint with Nathaniel Stevens), started September 2018, topic: Experiments on Networks

Khaled Fouda, Statistics Masters (joint with Aurelie Labbe, HEC Montreal), started November 2022, topic: Analyzing Disruptions in a Subway Network

I have supervising the following graduate students and post-doctoral fellows:

Mohsen Ebadi, Statistics PostDoc (joint with Shoja Chenouri), January 2019- December 2021, topic: Multivariate Process Monitoring

Daniel Grant, 2021, Statistics MMath, title: “Modeling Probability of Detection by Dose Relationships”

Zhaoyu (Kenny) Guo, 2021, Statistics MMath (joint with Nathaniel Stevens), title: “Statistical Methods for Hospital Comparison”

Narges Motabeli, July 2018 – June 2019, visting PhD Statistics, project supervisor, title: “Hurdle blockmodels for sparse network modeling"

Xin Dong, 2019, MMath Statistics, essay supervisor, title: “Likelihood-Based Approach for Finding a Dominant Cause in Statistical Engineering”

Sigeng Chen, 2019, MMath Statistics, essay supervisor, title: “Assessing a Binary Measurement System Using Targeted Verification with a Continuous Measurand”

Manda Winlaw, Mitacs Accelerate Post-Doctoral Fellow, June 2017 – October 2018, in collaboration with Intelligent Mechatronic Systems (IMS), “Using Telematics Data to Identify Risky Driver Behaviours”.

Wenling Zhang, 2018, MMath Statistics, essay supervisor, title: “Assessing Measurement Systems for Count Data”

TaeHyun Choi, 2017, Statistics Masters, essay supervisor, title: “Assessing Classification Systems”

Daniel Severn, 2017, Statistics Ph.D. “Assessing Binary Measurement Systems: Using Partial Verification with a Gold Standard”

Hyukjun (Jay) Gweon, 2017, Statistics Ph.D. (joint with Matthias Schonlau) “Statistical Learning Approaches to Some Classification Problems”

Patricia Cooper Barfoot, 2016, Statistics Ph.D. “A Weighted Estimating Equation Approach to Model a Risk-Adjusted Parameter with a Bias/Variance Trade-off”

Kevin Fan, Statistics Masters, Sept. 2015-August 2016, title: “Comparison of a Random Effects Model with a Simple Non-parametric Approach in Assessing a Binary Measurement System”

Nathaniel Stevens, Post-Doctoral Fellow, Jan.-July 2015, title: “Probability of Agreement Approach”

Nathaniel Stevens, 2014, Statistics Ph.D., supported by a NSERC Postgraduate Scholarship, title: “Assessment and Comparison of Continuous Measurement Systems”

Oana Danila, Post-Doctoral Fellow, May-Dec. 2013, title: “Assessing Binary Measurement Systems with Varying Misclassification Rates”

Oana Danila, 2012, Statistics Ph.D., supported by an Ontario Graduate Scholarship, title: “Assessing Binary Measurement Systems”

Chunwei Lai, 2012, Statistics Masters – essay supervisor, title: “Estimating the Error Rates of a Binary Inspection System Using Conditional Sampling Plans and a Reference System”

Jenna Voisin, 2011, Statistics Masters – essay supervisor, title: “Assessment of a Binary Measurement System using an Anchored Reference System”

Nathaniel Stevens, 2011, Statistics Masters – essay supervisor, supported by a NSERC Postgraduate Scholarship, title: "Statistical Process Control: A View on the Fundamental Definitions and Terminology"
Ryan Browne, 2009, Statistics Ph.D., supported by a Research in Motion/NSERC Industrial Postgraduate Scholarship, title: "Leveraged Plans for Measurement System Assessment"
Hossein Asilahijani, 2008, Systems Design Engineering Masters – thesis supervisor, title: "Reducing Variation in an Existing Process with Robust Parameter Design"
Ryan Browne, 2006, Statistics Masters – essay supervisor, title: "Leveraged Measurement System Assessment"
Oana Danila, 2006 Statistics Masters – essay supervisor, title: "Assessing Binary Measurement Systems"
Sofia Mosesova, 2006, Statistics Ph.D. – local supervisor (supervisor Hugh Chipman, Acadia University), title: "Dimension Reduction and Model-based Clustering of Functional Data"
Jiaqiong Xu, 2004, Statistics Ph.D. – joint supervisor with B. Abraham, title: "Outlier Detection Methods in Multivariate Regression Models"
Stephanie Jacques, 2001, Statistics Masters – essay supervisor
Lan Pham, 2001, Statistics Masters – essay supervisor
Tim Dietrich, 1998, Statistics Masters – essay supervisor

Graduate Student Supervision Summary

	Current	Completed
Masters	1	16
PhD	2	8
PostDoc	1	4

PUBLICATIONS

Books and Book Chapters

1. Steiner SH, **Fan K**, Mackay RJ (2021), "Assessing a Binary Measurement System with Operator and Random Part Effects," *Frontiers in Statistical Quality Control 13*, Sven Knoth, Wolfgang Schmid, editors, p. 317-337.
2. Steiner SH (2014), "Risk-adjusted Monitoring of Outcomes in Health Care," Chapter 14 in *Statistics in Action: A Canadian Outlook*, edited by Jerry Lawless, Statistical Society of Canada, 245-264, Chapman and Hall/CRC.
3. Steiner SH and Mackay RJ (2005), *Statistical Engineering: An Algorithm for Reducing Variation in Manufacturing Processes,* Quality Press, American Society for Quality, Milwaukee, WI, ISBN 0-87389-646-7
4. Steiner SH and Mackay RJ (2004) "Effective Monitoring of Processes with Parts Per Million Defective: A Hard Problem" *Frontiers in Statistical Quality Control 7*, H.J. Lenz and P.T. Wilrich editors, Physica-Verlag, 140-149.
5. Steiner SH, Cook R and Farewell V (2003) "Risk-adjusted Monitoring of Binary Surgical Outcomes," IMIA (International Medical Informatics Association) Yearbook of Medical Informatics. Quality of Health Care: The Role of Informatics, Schattauer GmbH Stuttgart Germany, 570-578.
6. Steiner SH and Mackay RJ (2001), "Detecting Changes in the Mean from Censored Lifetime Data," *Frontiers in Statistical Quality Control 6*, H.J. Lenz and P.T. Wilrich editors, Physica-Verlag, 275-289.

Research Articles in Peer Reviewed Journals (students in bold)

1. Anderson-Cook, CM, Lu, L (editors); Brenneman WA, de Mast J, Faltin FW, Freeman LJ, Guthrie WF, Hoerl, R, Jensen W, Jones-Farmer A, Leber DD, Patterson A, Perry MB, Steiner SH, Stevens NT (2022). "Statistical Engineering - Part I: Past and Present," accepted for publication in *Quality Engineering.*

2. Anderson-Cook, CM, Lu, L (editors); Brenneman WA, de Mast J, Faltin FW, Freeman LJ, Guthrie WF, Hoerl, R, Jensen W, Jones-Farmer A, Leber DD, Patterson A, Perry MB, Steiner SH, Stevens NT (2022). "Statistical Engineering - Part II: Future," accepted for publication in *Quality Engineering*
3. **Chen S**, Steiner SH, Mackay RJ, Mulayath Variyath A (2022), "Assessing a Binary Measurement System with an Underlying Measurand using Targeted Verification, *Communications in Statistics: Case Studies, Data Analysis and Applications*, 8, 308-330.
4. De Mast J, Steiner SH, Nuijten WPM, Kapitan D (2022), "Analytical Problem Solving based on Causal, Correlational and Deductive Models, *The American Statistician*, to appear
5. Stevens NT, Sen A, **Kiwon F**, Morita PP, Steiner SH, Zhang Q (2022), "Estimating the Effects of Non-pharmaceutical Interventions and Population Mobility of Daily COVID-19 Cases: Evidence from Ontario, *Canadian Public Policy*, 48, 144-161.
6. Hamada MS, Casleton EM, Osthus D, Weaver BP, Steiner SH (2022), "Analyzing Count Data with Measurement Error," *Quality and Reliability Engineering International*, 38: 2345-2355.
7. **Ebadi M**, Chenouri S, Lin DKJ, Steiner SH, (2022) "Statistical Monitoring of the Covariance Matrix in Multivariate Processes: A Literature Review" *Journal of Quality Technology*, 54, 269-289. DOI: 10.1080/00224065.2021.1889419
8. **Barfoot Cooper PL**, Steiner SH and Mackay RJ (2021), "Estimating and comparing diagnostic laboratory performance with weighted estimating equations," accepted for publication in *Journal of Biometrics & Biostatistics*, April 2021.
9. **Panahi M**, de Mast J and Steiner SH (2021) "Identifying Dominant Causes using Leveraged Study Designs," *Quality Engineering*, 33(4), 581-593.
10. Osthus DA, Weaver BP, Casleton EM, Hamada MS, Steiner SH (2021) "On Gauge R & R Studies for Counts," *Quality Engineering*, 33(4), 641-654.
11. Woodall WH, Rakovich G and Steiner SH (2021) "An overview and critique of the use of cumulative sum (CUSUM) methods with surgical learning curve data," *Statistics in Medicine*, 40, 1400–1413.
12. **Motalebi N**, Stevens NT and Steiner SH (2021), "Hurdle blockmodels for sparse network modeling", *The American Statistician,* 75(4), 383-393
13. Steiner SH, Stevens NT, Jensen WA and Mackay RJ (2019), "Replacing a current measurement system in an inspection scheme: A case study," *Quality Engineering*, 31:4, 615-626, DOI: 10.1080/08982112.2019.1565578
14. de Mast J, Steiner SH, Kuijten R and Elly Funken-Van den Bliek E (2019), "Statistical reasoning in diagnostic problem-solving—The case of flow-rate measurements," *Quality Engineering*, 31:3, 484-498, DOI: 10.1080/08982112.2018.1548022
15. **Gweon H**, Schonlau M, Steiner SH (2019), "Nearest labelset using double distances for multi-label classification," *PeerJ Computer Science*, 5:e242 https://doi.org/10.7717/peerj-cs.242
16. **Gweon H**, Schonlau M and Steiner SH (2019), "The k conditional nearest neighbor algorithm for classification and class probability estimation," *PeerJ Computer Science*, 5, e194, https://doi.org/10.7717/peerj-cs.194
17. Steiner SH and Mackay RJ (2019), "Response to Open Challenges on Correlation of Intermediate and Final Measurements – Solving the Impossible Problem?" *Quality Engineering*, 31:3 511-515.
18. **Severn DE**, Steiner SH and Mackay RJ (2019), "Assessing a Binary Measurement System: A New Plan Using Targeted Verification with Conditional Sampling and Baseline Information," *Measurement*, 146, 101-109.
19. **Winlaw M**, Steiner SH, Mackay RJ and Hilal AR (2019), "Using Telematics Data to Find Risky Driver Behaviour," *Accident Analysis & Prevention*, 131, 131-136.
20. **Barfoot Cooper PL**, Steiner SH and Mackay RJ (2018), "Comparing and Monitoring Risk-Adjusted Hospital Surgical Performance: A Weighted Estimating Equation Approach," *Medical Decision Making: Policy and Practice*, 3(1), 1-12.

21. **Stevens NT**, Steiner SH, Mackay RJ (2018) "Comparing Heteroscedastic Measurement Systems with the Probability of Agreement," *Statistical Methods in Medical Research,* 27(11), 3420-3435, https://doi.org/10.1177/0962280217702540
22. **Barfoot Cooper PL**, Steiner SH, Mackay RJ (2017), "Bias/Variance Trade-off in Estimates of a Process Parameter based on Temporal Data," *Journal of Quality Technology*, 49, 301-319.
23. **Gweon H**, Schonlau M, Kaczmirek L, Blohm M, Steiner SH (2017) "Three Methods for Occupation Coding Based on Statistical Learning," *Journal of Official Statistics*, 33, 101-122.
24. Hamada M, Steiner SH, Mackay RJ, Reese S (2017), "Planning and Analyzing Experiments with Models that Distinguish Between Replicates and Repeats, *Quality and Reliability Engineering International*, 33, 657-668.
25. **Stevens NT**, Steiner SH and Mackay RJ (2017) "Assessing Agreement Between Two Measurement Systems: An Alternative to the Limits of Agreement Approach" *Statistical Methods in Medical Research*, 26, 2487-2504.
26. Steiner SH and Woodall WH (2016). Debate: What is the Best Method to Monitor Surgical Performance? *BMC surgery*, *16*(1), 1-4.
27. Erdmann TP, **Akkerhuis TS**, deMast J and Steiner SH (2016) "The Statistical Evaluation of a Binary Test based on Combined Samples," *Journal of Quality Technology,* 48, 54-67.
28. Steiner SH**, Lu Y,** Mackay RJ (2016) **"**Assessing Binary Measurement Systems and Inspection Protocols Utilizing Follow-up Data**,"** *Quality Engineering*, 28, 329-336. (winner of the American Society for Quality's **Brumbaugh Award**)
29. **Severn DE**, Steiner SH and Mackay RJ (2016) "Assessing Binary Measurement Systems: A Cost-Effective Alternative to Complete Verification," *Journal of Quality Technology*, 48, 128-138.
30. Steiner SH, Danila O, Cotton CA, **Severn DE**, Mackay RJ (2016) "Comparing Two Binary Diagnostic Tests with Repeated Measurements," *JRSS-C Applied Statistics* 65, 315-329, DOI: 10.1111/rssc.12122
31. Cotton CA, Danila O, Steiner SH, **Severn DE**, Mackay RJ (2015) "Using Available Information in the Assessment of Diagnostic Protocols," *Journal of Biometrics & Biostatistics,* 6, 1-8.
32. Woodall WH, Fogel SL and Steiner SH (2015), "The Monitoring and Improvement of Surgical Outcome Quality," *Journal of Quality Technology,* 47, 383-399.
33. Gombay E, Hussein AA and Steiner SH (2015), "Flexible Risk-adjusted Surveillance Procedures for Autocorrelated Binary Series", *Canadian Journal of Statistics*, 43, 403-419.
34. **Stevens NT**, Steiner SH, Mackay RJ (2015) "Being Smart about Parts" *Quality Progress,* March, 32-37.
35. Jones-Farmer A, Woodall W, Steiner SH and Champ CW (2014), "An Overview of Phase I Analysis for Process Improvement and Monitoring" *Journal of Quality Technology*, 46, 265-280. (winner of the Statistics Division of the American Society for Quality's **Lloyd Nelson Award**)
36. Viveros-Aguilera R, Steiner SH and Mackay RJ (2014) "Monitoring Product Size and Edging from Bivariate Profile Data," *Journal of Quality Technology*, 46, 199-215.
37. Steiner SH and Mackay RJ (2014), "Monitoring Risk-adjusted Medical Outcomes Allowing for Changes Over Time," *Biostatistics*, 16, 665-676.
38. Steiner SH and Mackay RJ (2014), "Statistical Engineering in Variation Reduction," *Quality Engineering*, (special issue devoted to first annual Hunter conference) 26, 44-60.
39. Steiner SH and Mackay RJ (2014), "Rejoinder", *Quality Engineering*, (special issue devoted to first annual Hunter conference) 26, 70-71.
40. **Stevens NT**, Steiner SH, Browne R, Mackay RJ (2013), "Gauge R&R Studies that Incorporate Baseline Information, *IIE Transactions*, 45, 1166-1175.
41. **Danila O**, Steiner SH and Mackay RJ (2013), "Assessing a Binary Measurement System with Varying Misclassification Rates when a Gold Standard is Available," *Technometrics,* 55, 335-345.
42. Jones M and Steiner SH, (2012) "Assessing the Effect of Estimation Error on Risk Adjusted CUSUM Chart Performance," *International Journal for Quality in Health Care*, 24 (2): 176-181.

43. **Danila O**, Steiner SH and Mackay RJ (2012), "Assessing a Binary Measurement System with Varying Misclassification Rates Using a Latent Class Random Effects Model," *Journal of Quality Technology,* 44, 179-191.
44. Hussein AA, Steiner SH and Gombay E (2011), "Monitoring Binary Outcomes Using Risk-adjusted Charts: A Comparative Study" *Statistics in Medicine*, 30, 2815-2826.
45. Steiner SH, **Stevens NT**, Browne R and Mackay RJ (2011), "Planning and Analysis of Measurement Reliability Studies," *Canadian Journal of Statistics*, 39, 344-355.
46. **Stevens NT**, Steiner SH, Mackay RJ and Smith IR (2011) "Monitoring Radiation in Cardiology Imaging Equipment," *Medical Physics,* 38, 317-326.
47. Morton A, Mengersen K, Waterhouse M, Steiner SH, Looke D (2010) "The Sequential Analysis of Uncommon Adverse Outcomes" *Journal of Hospital Infection*, 76, 114-118.
48. Morton A, Mengersen K, Waterhouse M, Steiner SH (2010) "The Analysis of Aggregated Hospital Infection Data for Accountability" *Journal of Hospital Infection*, 76, 287-291.
49. **Stevens NT**, **Browne R**, Steiner SH and Mackay RJ (2010) "Augmented Measurement System Assessment," *Journal of Quality Technology*, 42, 388-399.
50. **Browne R**, Steiner SH, Mackay RJ (2010) "Leveraged Gauge R&R Studies," *Technometrics*, 52, 294-302 (winner of the American Statistical Association's **W.J. Youden Award** in Interlaboratory Testing).
51. **Danila O**, Steiner SH and Mackay RJ (2010), "Assessment of a Binary Measurement System in Current Use," *Journal of Quality Technology,* 42, 152-164.
52. Steiner SH and Jones M (2010) "Risk Adjusted Survival Time Monitoring with an Updating Exponentially Weighted Moving Average (EWMA) Control Chart" *Statistics in Medicine*, 29, 444-454.
53. **Browne R**, Steiner SH, Mackay RJ (2010) "Optimal Two-Stage Reliability Studies," *Statistics in Medicine*, 29, 229-235.
54. Steiner SH, Grant K, Coory M, Kelly HA (2010) "Detecting the Start of an Influenza Outbreak using Exponentially Weighted Moving Average Charts," *BMC Medical Informatics and Decision Making*, 10:37.
55. **Asilahijani H**, Steiner SH and Mackay RJ (2010) "Reducing Variation in an Existing Process with Robust Parameter Design" *Quality Engineering,* 22, 30-45.
56. Steiner SH and Mackay RJ (2009) "Teaching Process Improvement Using a Virtual Manufacturing Environment," *American Statistician,* 63, 4: 361-365.
57. Steiner SH and Mackay RJ (2009) "Designed Experiments with Fixed and Varying Inputs – A Cautionary Tale," *Quality Engineering*, 21, 384-391.
58. **Browne R**, Mackay RJ and Steiner SH. (2009) "Improved Measurement System Assessment for Processes with 100% Inspection", *Journal of Quality Technology* 41, 376-388.
59. **Browne R**, Mackay RJ and Steiner SH. (2009) "Two Stage Leveraged Measurement System Assessment," *Technometrics*, 51, 239–249.
60. Chenouri S, Steiner SH and Variyath AM (2009) "A Multivariate Robust Control Chart for Individual Observations" *Journal of Quality Technology,* 41, 259-271.
61. **Liu X**, Mackay RJ and Steiner SH (2008) "Monitoring Multiple Stream Processes," *Quality Engineering*, 20, 296-308.
62. **Danila O**, Steiner SH and Mackay RJ. (2008) "Assessing a Binary Measurement System," *Journal of Quality Technology*, 40, 3, 312-320.
63. Steiner SH, Mackay RJ and Ramberg JS (2008). "An Overview of the Shainin System™ for Quality Improvement", with discussion *Quality Engineering*, 20:1, 6–19.
64. Steiner SH, Mackay RJ and Ramberg JS (2008). Rejoinder to discussion of "An Overview of the Shainin System™ for Quality Improvement", *Quality Engineering*, 20:1, 42–45.
65. Steiner SH, Hamada M, **Giddings White BJ**, Kutsyy V, **Mosesova S** and **Salloum G** (2007) "Using Projects in an Advanced Design of Experiments Class: A Bubble Mixture Experiment Example," *Journal of Statistics Education*, March (online journal).

66. Steiner SH and Mackay RJ (2006), "Statistical Engineering: A Case Study," *Quality Progress,* June, 33-39.
67. Steiner SH and Mackay RJ (2006), "An Algorithm to Reduce Process Variation," European Network for Business and Industrial Statistics (ENBIS) Magazine insert in *Scientific Computing World*, April-May, 36-37.
68. Novick RJ, Fox SA, Stitt LW, Forbes TL and Steiner SH. (2006), "Direct Comparison of Risk-adjusted CUSUM and Non-risk Adjusted Analyses of Coronary Artery Bypass Surgery Outcomes," *Journal of Thoracic and Cardiovascular Surgery*, 132, 2, 386-391.
69. Hamada M, Martz H and Steiner SH (2005) "Accounting for Mixing Errors in Analyzing Mixture Experiments, *Journal of Quality Technology* 37, 139-148.
70. Forbes TL, Steiner SH, Lawlor DK, DeRose G and Harris KA (2005) "Risk Adjusted Analysis of Outcomes Following Elective Open Abdominal Aortic Aneurysm Repair" *Annals of Vascular Surgery*, 19(2), 142-148.
71. Harris JR, Forbes TL, Steiner SH, Lawlor DK, DeRose G and Harris KA (2005) "Risk adjusted analysis of early mortality following ruptured abdominal aortic aneurysm repair" *Journal of Vascular Surgery*, 42, 3, 387-39.
72. Steiner SH and Mackay RJ (2004) "Scale Counting", *Technometrics*, 46, 348-354. (Winner of the American Society for Quality's **Wilcoxon Prize**).
73. Cook DA, Steiner SH, Cook R and Farewell V (2003) "Monitoring the Evolutionary Process of Quality: Tracking Outcomes in Intensive Care with the Risk Adjusted CUSUM," *Critical Care Medicine*, 6, 1676-1682.
74. Drezner Z, Steiner SH and Wesolowsky GO (2002) "On the Circle Closest to a Set of Points," *Computers and Operations Research,* 29, 637-650.
75. Steiner SH and Mackay RJ (2001), "Monitoring Processes with Data Censored Owing to Competing Risks by using Exponentially Weighted Moving Average Control Charts," *JRSS-C Applied Statistics,* 50, 293-302.
76. Steiner SH, Cook R and Farewell V (2001), "Risk Adjusted Monitoring of Surgical Outcomes," *Medical Decision Making*, 21, 163-169.
77. Steiner SH, Cook R, Farewell V and Treasure T (2000), "Monitoring Surgical Performance Using Risk Adjusted Cumulative Sum Charts," *Biostatistics*, 1, 441-452.
78. Steiner SH (2000), "Statistical Process Control Using Two Measurement Systems," *Technometrics*, 42, 178-187.
79. Steiner SH and Mackay RJ (2000), "Monitoring Processes with Highly Censored Data," *Journal of Quality Technology*, 32, 199-208.
80. Steiner SH (1999), "EWMA Control Charts with Time-Varying Control Limits and Fast Initial Response," *Journal of Quality Technology*, 31, 75-86.
81. Steiner SH, Cook R and Farewell V (1999) "Monitoring Paired Binary Surgical Outcomes Using Cumulative Sum Charts," *Statistics in Medicine*, 18, 69-86.
82. Steiner SH (1999), "Confirmation Sample Control Charts," *International Journal of Production Research*, 37, 737-748.
83. Steiner SH (1998) "Grouped Data Exponentially Weighted Moving Average Control Charts," *JRSS-C Applied Statistics,* 47, 203-216.
84. Steiner SH (1997-1998), "Pre-control and Some Simple Alternatives," *Quality Engineering*, 10, 65-74.
85. Mackay RJ and Steiner SH (1997-1998), "Strategies for Variability Reduction," *Quality Engineering,* 10, 125-136.
86. Steiner SH and Hamada M (1997), "Making Mixtures Robust to Noise and Mixing Measurement Errors," *Journal of Quality Technology*, 29, 441-450.
87. Steiner SH, Geyer PL and Wesolowsky GO (1996), "Grouped Data Sequential Probability Ratio Tests and Cumulative Sum Control Charts," *Technometrics,* 38, August, 230-237.

88. Steiner SH, Geyer PL and Wesolowsky GO (1996), "Shewhart Control Charts to Detect Mean Shifts Based on Grouped Data," *Quality and Reliability Engineering International*, 12, 345-353.
89. Geyer PL, Steiner SH and Wesolowsky GO (1996), "Optimal SPRT and CUSUM Procedures with Compressed Limit Gauges," *IIE Transactions*, 28, 489-496.
90. Steiner SH, and Wesolowsky GO (1995), "Estimating the Correlation between Destructively Measured Variables Using Proof-loading," *Technometrics*, 37, 1, 94-101.
91. Steiner SH, Geyer PL and Wesolowsky GO (1994), "Control Charts Based on Grouped Observations," *International Journal of Production Research*, 32, 1, 75-91.
92. Steiner SH and Wesolowsky GO (1994), "Simultaneous Acceptance Control Charts for Products with Multiple Correlated Characteristics," *International Journal of Production Research*, 32, 3, 531-543.

Contributions to Discussion Papers

93. Stevens NT and Steiner SH (2022), Discussion in Anderson-Cook C and Lu L "Statistical Engineering – Part I: Past and Present, *Quality Engineering*, in press.
94. Stevens NT and Steiner SH (2022), Discussion in Anderson-Cook C and Lu L "Statistical Engineering – Part II: Future, *Quality Engineering*, in press.
95. Rakovich G, Woodall WH and Steiner SH (2022), Comment on the CUSUM Surgical Learning Curve Analysis in Dimitrovska et al. (2021) *Interactive Cardio Vascular and Thoracic Surgery*, in press.
96. Steiner SH (2019) Discussion of "Doctors are not Pilots and Patients are not Airplanes: Quality Improvement in Medicine", *Quality Engineering,* (special issue devoted to sixth annual Hunter conference), 31, 12-15.
97. Steiner SH (2016) Discussion of "Modern measurement, probability, and statistics: Some generalities and multivariate illustrations" by Vardeman SB, *Quality Engineering*, (special issue devoted to third annual Hunter conference) 28, 17-18.
98. Steiner SH and Mackay RJ (2015) Discussion of "Statistics: A Life Cycle View" by Kenett RS, *Quality Engineering*, (special issue devoted to second annual Hunter conference) 27, 126-127.
99. **Danila O**, Mackay RJ and Steiner SH (2014), Discussion of "The Statistical Evaluation of Categorical Measurements: Simple Scales, but Treacherous Complexity Underneath" by de Mast J, Akkerhuis T and Erdmann T, *Quality Engineering*, (special issue devoted to first annual Hunter conference) 26, 33-39.
100. Mackay RJ and Steiner SH (2012), panel discussants on Anderson-Cook C and Lu L. (editors) "Statistical Engineering – Forming the Foundations", *Quality Engineering*, 24, 110-132.
101. Mackay RJ and Steiner SH (2012), panel discussants on Anderson-Cook C and Lu L. (editors) "Statistical Engineering – Roles for Statisticians and the Path Forward", *Quality Engineering*, 24, 133-152.
102. Chipman HA, Mackay RJ and Steiner SH (2010), Discussion of "Nonparametric Profile Monitoring by Mixed Effects Modeling" by Qiu P, Zou C and Wang Z, *Technometrics*, 52, 280-283.
103. Steiner SH (2006), Discussion of William H. Woodall's "The Use of Control Charts in Health-Care and Public-Health Surveillance," *Journal of Quality Technology*, 111-112, 38.
104. Steiner SH (2000), Discussion of "Controversies and Contradictions in Statistical Process Control," by Woodall WH, *Journal of Quality Technology*, 32, 370-372.

Other Contributions

105. Rakovich G, Woodall WH, Steiner SH (2022). Comment on the CUSUM Surgical Learning Curve Analysis in Dimitrovska et al. (2021), accepted for publication in *Interactive Cardio Vascular and Thoracic Surgery*.
106. Steiner SH (2019), "Comment on "Doctors are not Pilots and Patients are not Airplanes: Quality Improvement in Medicine" by Sandy L. Fogel," *Quality Engineering*, 31:1, 12-15, DOI: 10.1080/08982112.2018.1501062

107. Steiner SH and Mackay RJ (2017), "We Do Need Good Measurement Systems," *Quality Digest*, https://www.qualitydigest.com/inside/six-sigma-article/we-do-need-good-measurement-systems-052417.html
108. Steiner SH (2008), Book review of "Statistical Development of Quality in Medicine" by Per Winkel and Nien Fan Zhang 2007, John Wiley and Sons, Chichester, England, *Biometrics*, 658-659, June.
109. Steiner SH and Mackay RJ (2009), "Letter to the Editor Re "Planning Experiments, the First Real Task in Reaching a Goal" by Viles et al., *Quality Engineering*, 21, 355-356.

Citation Summary from Google Scholar [November 29, 2022]

Citation indices

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INVITED CONFERENCE PRESENTATIONS AND WORKSHOPS

I have given 80+ invited conference presentations and workshops. Here I list only the plenary talks and half day or longer conference workshops.

"Research, Teaching and Consulting Synergies," Don Owen Award talk at the Conference of Texas Statisticians, (online), Texas Tech University, October 9, 2021.

"Variation Transmission Studies," American Society for Quality, Toronto Section annual conference (online), April 17, 2021.

"Watfactory: A Virtual Manufacturing Environment for Teaching Process Improvement (and Statistics more generally!)", Ort Bruade College, ½ day student workshop, May 25, 2018

"Playing the Game: Reducing Variation in a Virtual Process," full day workshop at the Quality and Productivity Research Conference, GE Global Research, Niskayuna, NY, June 4, 2013.

"Statistical Engineering in Variation Reduction", **keynote address** (90 minutes), Hunter Conference, Amsterdam, The Netherlands, March 20, 2013.

"Teaching Process Improvement Using a Virtual Manufacturing Process," Half-day Short Course, European Network for Business and Industrial Statistics (ENBIS) Annual Conference, Dortmund, Germany, Sept. 26, 2007.

"Use of the Statistical Method in Variation Reduction Projects", **keynote address**, European Network for Business and Industrial Statistics (ENBIS) Annual Conference, Dortmund, Germany, Sept. 24, 2007.

"Statistical Engineering," One-day Short Course, Annual Industrial Engineering Conference, Orlando, Florida, May 21, 2006.

"Statistical Engineering," One-day Short Course, Fall Technical Conference, St. Louis. MI, Oct. 19, 2005.

"Monitoring Processes with Parts Per Million Defective," Intelligent Quality Control (ISQC) Workshop, Waterloo, Ont. Sept. 6, 2001.

"Detecting Changes in the Mean from Censored Lifetime Data," Intelligent Statistical Quality Control (ISQC) Workshop, Würzburg, Germany, Sept. 1998.

JOURNAL EDITORSHIPS

Journal of Quality Technology, Associate Editor: July 2000 to June 2006 and Jan. 2011-present

Journal of Quality Technology, Case Studies Editor: July 2012-June 2018

Technometrics, Associate Editor June 2010 to December 2013.

Quality Engineering, Guest Editor of special issue devoted to papers from the Hunter conference 2013 and 2016.

Annals of Applied Statistics, Associate Editor: October 2008 to August 2010.
Quality Technology and Quantitative Management, Associate Editor: June 2006 to May 2007.

CONFERENCE ORGANIZATION

Chair of the program committee and local organizer for the fourth annual Stu Hunter research conference, Waterloo, March 2016.
Program committee for Quality and Productivity Conference, Schenectady, NY, June 2013.
Co-conference organizer for the first annual Stu Hunter research conference, Heemskerk, The Netherlands, March 2013.
Scientific Program Chair for International Society for Business and Industrial Statistics (ISBIS) conference in Slovenia, July 2010.
Organizing committee and co-chair for contributed papers for the International Society for Business and Industrial Statistics (ISBIS) 7 conference, Azores, August 2007.
Business and Industrial Statistics Section sessions and workshop organizer for the Statistical Society of Canada's Annual Meeting, Saskatoon, June 2005.
Scientific program committee and local organizer for the VIIth Workshop on Intelligent Statistical Quality Control, Waterloo, September 2000.

PROFESSIONAL SOCIETY INVOLVEMENT

Chair-Elect, Chair and Past-Chair of the International Statistical Engineering Association, 2020-22.
Chair of the American Society for Quality Bisgaard award committee for best paper in *Quality Engineering*, 2019-2020.
Secretary of the International Statistical Engineering Association, 2019.
Management Board member for the Stu Hunter annual conference, March 2017 – Feb. 2020.
Snedecor Award Committee member, Statistical Society of Canada, October 1, 2016 – Sept. 30, 2020.
Publications Management Board member, American Society for Quality (ASQ), 2015-2018.
Technometrics Management Committee member (ASQ rep), Jan, 2016 - Dec. 2018.
Chair for Meeting of Department Heads at the Statistical Society of Canada Annual Meeting, 2014-2016 and 2018-2021.
Developed and coordinated the student process improvement contest (based on Watfactory) for the American Statistical Association's Quality and Productivity section, 2011.
Council member, International Society for Business and Industrial Statistics, August 2009 to August 2011.
Professional development committee, Statistical Society of Canada, 2006-2008.
President elect, president and past president of the Business and Industrial Statistics (BISS) Section of the Statistical Society of Canada, 2003-2005.
Selection committee, Lloyd Nelson award of the American Society for Quality, 2007.
Council of chapters representative for the Southern Ontario/Toronto Chapter of the American Statistical Association 1998-2000.

TEACHING EXPERIENCE

I have taught university level courses on a wide variety of topics including: calculus, management science, statistics, probability, regression, time series, experimental design, survey sampling, statistical process control, simulation and statistical engineering. I have also taught short courses for industry on statistical engineering, experimental design, data mining and statistical thinking.

University of Waterloo Courses
ME 202: Statistics for Engineers, taught Winter 2010 and 2011
STAT 230; Probability, taught Spring 1995

STAT 231: Statistics, taught Winter 1999, 2000, 2004, 2005, Spring 2000 (x2), 2001, 2003, 2005 (x2) and Fall 2001
STAT 311: Regression and Forecasting for Accounting, taught Fall 1996 (x2), 1997 (x2), 1998 (x2), 1999 (x2), 2000 (x2)
STAT 331: Applied Linear Models, taught Winter 1996 and Winter 1998
STAT 332: Sampling and Experimental Design, taught Spring 2006, Spring 2008 and Fall 2009
STAT 335: Statistical Process Control, taught Winter 1996
STAT 340: Stochastic Simulation Methods, taught Winter 2007
STAT 371: Applied Linear Models and Process Improvement for Business, taught Fall 2005 and Spring 2012
STAT 372: Survey Sampling and Experimental Design Techniques for Business, taught Winter 2012, Spring 2012 and Winter 2014
STAT 430/830: Experimental Design, taught Spring 2001, Fall 2001, Spring 2003, Spring 2004 and Spring 2006
STAT 435/835: Statistical Methods for Process Improvements, taught Winter 2004, 2005, 2007, 2008, 2010, 2011, 2012, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022
STAT 443: Forecasting, taught Winter 1998, 1999 2000, 2008 and Spring 2008
SYDE 213: Statistics, taught Winter 1995

Industrial Short Courses
Statistical Thinking for Managers, Atlantis Aerospace, 1995 and 1996
Data Mining, Institute for Improvement in Quality and Productivity (IIQP) Public Course, 1998 and 1999
Design of Experiments, IIQP Public Course, 1999 and 2000, Toyota 2006
Statistical Engineering, IIQP Public Course, 2000, 2003, Toyota 2004, Behr Thermal Products 2007, Nissan 2010 (x2) and 2011, Research in Motion 2011, Johnson and Johnson Vision Care, 2022. Also given as a short course at Fall Technical Conference 2005 and the Annual Industrial Engineering Conference 2006.
Playing the Game: Reducing Variation in a Virtual Process, Quality and Productivity Research Conference Short Course 2013
Watfactory: A Virtual Manufacturing Environment for Teaching Process Improvement (and Statistics more generally!), Bruade College 2018

CONSULTING ACTIVITY

Since 1992 I have been an active management and industrial consultant. I have worked together with a large variety of firms, including General Motors Canada, Nissan, Toyota, Ford, Nortel, Seagrams, many smaller automotive suppliers, the U.S. Army, and state and local governments. I continue to actively pursue consulting opportunities through the Business and Industrial Statistics Research Group (BISRG) at the University of Waterloo. My consulting activities have included the following firms (with project names given in parenthesis):
Atlantis Aerospace (evaluation of maintenance diagnostic software, statistical thinking for managers)
Behr Thermal Products (variety of Statistical Engineering projects)
Bendall (assessing and improving reliability)
ComDev (improving satellite switches with experimental design)
Dana (cooler warranty data project)
General Motors Canada (data mining of agile manufacturing process, wheel balancing improvement)
Intelligent Mechatronics Systems (risk prediction with automotive telematics data)
Federal Drug Administration (review of drug shortage avoidance plans)
Fisher and Paykel (increasing robustness of refrigerators)
Ford Motor Company (review of high mileage projects)
Katlyn (downtime analysis)
Magna Vectrics (assessing visual object identification system)

Nexans (experimental design to increase compression strength)
Nissan (variety of quality improvement projects)
Nortel (analysis of customer satisfaction data, finding patterns and structure in process data, analysis of network data)
Open Text (predicting software maintenance costs)
Petro Canada (monitoring batched processes)
Precision Plastics (general quality improvement)
Research in Motion – Blackberry (field failure prediction, process monitoring, net promoter score tracking)
Seagrams (measurement systems assessment)
TDS (scale counting)
Toyota Canada (reducing variation in toe alignment angle, parking brake clicks, reducing scrap due to splits in stampings)
Vision Systems (assessing a binary measurement system)
Wescast (tool wear analysis, Statistical Engineering projects, variation reduction approaches training)
Woodbridge Foam (reduction of voids)