Jen Tang

OFFICE: Daniels School of Business   HOME: 117 Pawnee Drive
Purdue University   West Lafayette, Indiana 47906
West Lafayette, Indiana 47907   Tel: (765) 775-6506
Tel: (765) 494-4497
E-mail: jtang@purdue.edu

_____

EDUCATION:

1977-1981   Ph. D., Department of Mathematics and Statistics
Bowling Green State University, Ohio
Mathematics (Major: Statistics)

1969-1973   B. S., Department of Business Mathematics
Soochow University, Taipei
Major: Business Mathematics

ACADEMIC POSITIONS

1991 - present   Professor (1999-present); Associate Professor (1991-1999, tenured 1994), Krannert Graduate School of Management, Purdue University, Indiana.

Quantitative Methods Area Coordinator: 1999, 2006, 2019

1981 - 1984   Assistant Professor, Department of Mathematics, Statistics, and Computer Science, Marquette University, Milwaukee, Wisconsin.

INDUSTRIAL POSITION

1984 - 1991   Member of Technical Staff, Quality and Reliability Technology and Switching Analysis Center, Bell Communications Research (Bellcore), N.J.

RESEARCH INTEREST:

- Multivariate Statistical Analysis (Dissertation Area)
- Bootstrap Method; Statistical Computing
- Applied Diffusion Processes
- Statistical Process Control and Engineering Control
- Data Mining
- Reliability and Degradation Tests

EDITORIAL BOARD MEMBERSHIP:

IIE Transactions (1996-2001).
Production and Operations Management (2000-present).

COURSES DEVELOPED AT PURDUE AND ELSWHERE:

MGMT 30500: Business Statistics
MGMT 30600: Management Science (Optimization)(Taught only)
MGMT 40500: Six Sigma & Quality Analytics
MGMT 57100: Data Mining
MGMT 67000: Business Analytics
MGMT 67000: Management Science I (Statistics)
MGMT 67100: Management Science II (Optimization)
MGMT 67200: Advanced Business Analytics
MGMT 67600: Stochastic Calculus and Ito Integrals (Ph.D. course)
MGMT 67700: Research Methods in Management Science (Ph.D. course)
MGMT 69000N: Six Sigma Quality Management
MGMT 69000: Tasting in Data Science (Contributor)
ISE 500: System Reliability (MS course, Rutgers University)
STAT 200: Probability Theory (National Tsing-Hua University)
STAT 600: Statistical Inference (Ph.D. course, National Tsing-Hua University)
STAT 601: Multivariate Analysis (Ph.D. course, National Tsing-Hua University
MATH: Introduction to Mathematical Statistics (MS course, Marquette University)
MATH: Differential Equations (Marquette University)
MATH: Calculus III (Marquette University)

HONOR AND GRANTS:

The Jay N. Ross Young Research Scholar Award (1992), School of Management, Purdue University.

The Best Professor in an MBA Core Course Award (2011), voted by Class-2011, GISMA, Germany/Purdue Krannert Graduate School, U.S./Leibniz University, Germany.

AlliedSignal Excellence in Teaching Award (1997), School of Management, Purdue University.

Honeywell Manufacturing Management Excellent in Teaching Award (2000), School of Management, Purdue University.

Salgo-Noren Outstanding MBA Teaching Award – runnerup (2000); Distinguished Instructor in Master's Program, Krannert Graduate School of Management, Purdue University (almost in every module I taught).

Summer research grants from the Dauch Center for Management of Manufacturing Enterprises, Purdue University: $7,100 (1995), $7,500 (1997), $8,400 (1999).

National Science Council (Taiwan) research grant: $43,730 (1997-1998), $25,000 (2003-2004), $25,000 (2004-2005).

Krannert Summer Research Award, Purdue University: $5,000 (2012), $6800 (2013), $14,000 (2015), $15,000 (2016).

National Science Council (Taiwan) research grant: $24,000 (2012), $31,395 (2013).

JOURNAL PUBLICATIONS:

[1]   "Clustering High-Dimensional Noisy Categorical Data," (2024) with Z. Tian, Z. and Xu, J.. Journal of American Statistical Association. Forthcoming.

[2]   "Two-stage Latent Variable Estimation Procedure for Time-Censored Accelerated Degradation Test," (2017) with Lee, M.Y., and Hu, C.H.. IEEE Transactions on Reliability, vol. 66 (4), 1266-1279.

[3]   "Optimal Design for Accelerated Degradation Tests for Wiener Degradation Processes with Time-Censoring," (2015) with Lee, M.Y., and Hu, C.H. European Journal of Operational Research, vol. 241, 412-421.

[4]   "Equivalent Step-stress Accelerated Life Tests with Log-location-scale Lifetime Distributions under Type-I Censoring," (2015) with Hu, C.H, and Plante, R.D. IIE Transactions, vol. 47, 245-257.

[5]   "Minimum Cost Allocation of Quality Improvement Targets under Supplier Process Disruption," (2013), with Wang, W., Plante, R.D. European Journal of Operational Research, vol. 228 (2), 388-396.

[6]   "Statistical Equivalency and Optimality of Simple Step-Stress Accelerated Test Plans for the Exponential Distribution," (2013), with C. H. Hu and R. E. Plante, Naval Research Logistics, vol. 60, 19-30.

[7]   "Step-stress Accelerated Life Tests - A Proportional Hazards Based Nonparametric Model," (2012), with C. H. Hu and R. E. Plante, IIE Transactions, 44, 754-764.

[8]   "Methods for Identifying Influential Variables in an Out-of-control Multivariate Normal Process," (2012), with C. L. Yen, Statistica Sinica, 22 (2), 847-868.

[9]   "Estimating Lifetime Distribution Based on Intermediate Degradation Data for Highly Reliable Products," (2008), with T. S. Su, Naval Research Logistics, 55, 265-276.

[10]   "Sample Size Determination for Achieving Stability of Double NEWMA Controller," (2007), with S. T. Tseng and C. H. Lin, Technometrics, 49, 409-419.

[11]   "A Modified EM-Algorithm for Estimating the Parameters of Inverse Gaussian Distribution Based on Time-Censored Wiener Degradation Data" (2007), with M. Y. Lee, Statistica Sinica, 17, 873-893.

[12]   "A Multivariate Two-Factor Skew Model," (2007), with A. K. Gupta and J. T. Chen, Statistics, 41, 301-309.

[13]   "Estimating the Limits for Statistical Process Control Charts: A Direct Method Improving Upon the Bootstrap," (2007), with S. Teyrachakul and S. Chand, European Journal of Operational Research, 178, 472-481.

[14]   "Reliability Analysis based on Degradation Data for Highly Reliable Products," (2003), with S.-T. Tseng and Y. H. Gu, Naval Research Logistics, 50, 1-14.

[15]   "Optimal Burn-in Time for Highly Reliable Products," (2002), with S.T. Tseng, International Journal of Industrial Engineering.

[16]   "Optimal Time-Based Pricing and Leadtime Policies for A Build-To-Order Manufacturer," (2002), with K. Tang, Production and Operations Management, 11, 374-392.

[17]   "Allocation of Variance Reduction Targets Among Suppliers," (2001), with H. Moskowitz and R. Plante, Naval Research Logistics, 48 (8), 684-709.

[18]   "Distribution of Aggregate Utility using Stochastic Elements of Additive Multiattribute Utility Models," (2000), with H. Moskowitz, and P. Lam, Decision Sciences, 31, 327-360.

[19]   "Univariate X-bar Control Charts for Individual Characteristics in a Multinormal Model," (2000), with D. Serel, and H. Moskowitz, IIE Transactions, 32, 1115-1125.

[20]   "Improving Quality via Matching: A Case Study Integrating Supplier and Manufacturer Quality Performance," (1999) with R. Plante, H. Moskowitz, and J. Duffy, Manufacturing and Service Operations Management, 1, 36-49.

[21]   "Exact Bayesian Estimation of System Reliability from Component Test Data," (1997), with K. Tang and H. Moskowitz, Naval Research Logistics, 44, 127-146.

[22]   "Variance Estimation on the Aggregate Utility in an Additive Utility Model with Random Parameters," (1997), with P. Lam, H. Moskowitz, and T. Eppel, Journal of Multi-Criteria Decision Analysis, 6, 25-40.

[23]   "Control Charts for Dependent and Multivariate Measurements," with R. L. Liu, Frontier of Intelligent Statistical Quality Control, (1997), ed. by P. Wilrich and H. Lenz, Springer-Verlag, vol. 5, 102-114.

[24]   "Control Charts for Dependent and Independent Measurements Based on Bootstrap Methods," (1996), with R. Y. Liu, Journal of American Statistical Association, 91, 1694-1770.

[25]   "A One-Sided Single Screening Procedure Based on Individual Unit Misclassification Error," (1995), with H.T. Tsai and H. Moskowitz, IIE Transactions, 27, 695-706.

[26]   "Statistical Process Control via Bootstrapping," (1994), with T. Seppala, H. Moskowitz, R. Plante, Journal of Quality Technology, 27, 139-153.

[27]   "Design of Screening Procedures: A Review," (1994), with K. Tang, Journal of Quality Technology, 26, 209-226.

[28]   "Bayes Confidence Interval for Reliability of Large Series Systems with Highly Reliable Components," (1994), with K. Tang and H. Moskowitz, IEEE Transactions on Reliability, R-43, 132-137.

[29]   "A Note on Parallel Machine Replacement," (1993), with K. Tang, Naval Research Logistics, 40, 569-573.

[30]   "Testing Independence of Several Groups of Variables," (1990), with A. K. Gupta, Journal of Statistical Computation and Simulation, 37, 27-35.

[31] "Design of Cost-effective Screening Procedures for Multi-characteristic Inspection," (1989), with K. Tang, Management Sciences, 35, 743-756.

[32] "A Two-sided Screening Procedures using Several Correlated Variables," (1989), with K. Tang, IIE Transactions, 21, 333-336.

[33] "On a General Distribution Theory for a Class of Likelihood Ratio Criteria," (1988), with A. K. Gupta, The Australian Journal of Statistics, 30, 3, 359-366.

[34] "Distribution of Likelihood Criteria and Box Approximation," (1987), with A. K. Gupta, Multivariate Statistical Models and Data Analysis, Reidel, 139-145.

[35] "On the Type-B Integral Equation and the Distribution of Wilks' Statistic for Testing Independence of Several Groups of Variables," (1987), with A. K. Gupta, Statistics, 18, 379-387.

[36] "On Testing Homogeneity of Variances for Gaussian Models," (1987), with A. K. Gupta, Journal of Statistical Computation and Simulation, 27, 155-173.

[37] "On Constructing and Maintaining a Beta Process Distribution for Bayesian Quality Audit Systems," (1987), with K. Tang and M. Peters, IIE Transactions, 98-106.

[38] "Estimating Low Process Average by Inverse Binomial Sampling," (1987), with K. Tang and H. Moskowitz, International Journal of Production Research, 25, 57-69.

[39] "On Testing Equality of Generalized Variances of k Multivariate Normal Populations," (1987), with A. K. Gupta, Publications de L'institut de Statistique, 32, 29-42.

[40] "Reporting Current Quality and Trends: 'I' Plots," (1986), with D. A. Guyton, ASQC Quality Congress, 591 - 599.

[41] "Some Properties of LR-Tests for Generalized Variances of Two Multivariate Normal Populations," (1986), with A. K. Gupta, Publications de L'institut de Statistique, 31, 59-69.

[42] "Exact Distribution of Certain General Test Statistics in Multivariate Analysis," (1986), with A. K. Gupta, The Australian Journal of Statistics, 27, 107 - 114.

[43] "Likelihood-Ratio Test of Equality of Generalized Variances from Two Gaussian Distributions," (1985), with A. K. Gupta, Estadistica, 37, no. 129, 17-30.

[44] "On the Exact Distribution of the Product of Independent Beta Variables," (1984), with A. K. Gupta, Statistics and Probability Letters, 2, 165 - 168.

[45] "Distribution of Likelihood-Ratio Statistic for Testing Equality of Covariance Matrices of Multivariate Gaussian Models," (1984), with A. K. Gupta, Biometrika, 71, 555 - 559.

INVITED BOOK REVIEW:

[1] "Review of 'Linear Statistical Models' by J. H. Stapleton," (1997), <u>IIE Transactions</u>.

[2] "Review of 'Creating Quality: Process Design for Results' by William J. Kolarik" (2000), <u>IIE Transactions</u>, 32, 563-564.

SUBMITTED MANUSCRIPTS:

[1] "Clustering High-dimensional Noisy Categorical Data," with Tian, Z., and Xu, J-M, <u>Journal of American Statistical Association</u> (JASA). (Revise and resubmit soon.)

WORKING PAPERS:

[1] "Statistically Optimal Design of Accelerated Degradation Tests," with Kwei Tang and Ming-Yung Lee.

[2] "Optimal Control Policy for Quality of the Metallic Film Thickness of Computer Connector Terminals," with Su-Fen Yang.

[3] "Incentive Outsourcing Contracts for Usage-Based Maintenance Policy," with Kwei Tang, M.-G. Wu.

[4] "A Production Lot Size Model for Products with Fixed Lifetime," with K. Tang.

[5] "Economic Design of CUSUM Chart with Variable Sampling," with Y. H. Wang.

[6] "Estimating Lifetime Distribution Based on Initial Degradation Data from a Wiener Degradation Process for Highly Reliable Products," (2003), with Chiu, C. Y., invited paper submitted to Journal of Data Science, Special Issue on Degradation Processes.

PROCEEDINGS PAPERS (ALL REVIEWED):

[1] "Selection of a Screening Variable for a Complete Inspection Plan When Inspection Error is Present," (1987), with K. Tang and H. Schneider, <u>Proceedings of Decision Sciences Institute</u>, 1109-1111.

[2] "Statistical Study of LCA X-Ray Analysis for the Determination of Pentachlorophenol in Wood," (1987), with J. N. Kressback and J. E. Walker, <u>The Proceedings of American Wood-Preservers' Association</u>, 273-285.

[3] "Process Quality Improvement: Statistical Techniques," (1989), <u>The Proceedings of the National Communications Forum</u>, Vol. 43, no. 2, 1153-1158.

[4] "Process Quality Improvement: Statistical Techniques (A Tutorial)," (1990), <u>The Proceedings of the National Communications Forum</u>, Vol. 44, 272-277.

[5]   "Control Charts for Dependent and Multivariate Processes," (1994), with R. L. Liu, <u>The Proceedings of the 5th International Conference on Intelligent Statistical Quality Control</u>, 139-157, Osaka, Japan.

BOOKS/BOOKLETS:

[1]   <u>Introduction to Quality Trend Charts</u>, (1986), Bellcore, New Jersey.

[2]   <u>Statistical Process Control Program Generic Requirements</u>, (1990), Bellcore, New Jersey.

OTHER PUBLICATIONS:

(None of my works below during 1984-91 at Bell Communications Research were published externally, mainly because they were mostly large projects containing proprietary information of a large number of manufacturers of telecommunications equipment.)

-   "Supplier Management System (SMS)," (1989), with C. Anderson and J. E. Walker; including a PC software package (a system implemented at Bellcore for managing a large number of suppliers of regional Bell Telephone companies).

-   "A Supplier Performance Model for the Surveillance Management Process (SMP)," (1989), with R. E. Hausman.

-   "Bellcore Quality Assurance Surveillance (BQAS) Activities Analysis," (1987).

-   "The Development and Methodology of Bellcore-Std-1000, A Continuous Sampling Plan for Supplier Variables Data Verification and Outgoing Quality Estimation Based on Verified Supplier's Data," (1985), with A. A. Dolinsky and T.C. Hsiang (a statistical plan for supplier variables data validation, successfully implemented at Northern Telecom, Inc. for its DMS-10 and -100 switching systems).

-   "The Development and Methodology of Bellcore-Std-1010, A Continuous Sampling Plan for Supplier Attributes Data Verification and Outgoing Quality Estimation Based on Verified Supplier's Data," (1985), with A. A. Dolinsky and T.C. Hsiang (a statistical plan for supplier attributes data validation, successfully implemented at Northern Telecom, Inc. for its DMS-10 and -100 switching systems).

-   "Developing a Supplier Statistical Process Control Program," (1989).

-   "Supplier Statistical Process Control Program Survey," (1988).

CONFERENCE PRESENTATIONS:

Invited talk on Tolerance Design, at American Statistical Association (ASA) 1985 Annual Meeting in Las Vegas, in a one-day tutorial on "Japanese Techniques for Quality Improvement -Taguchi Methods," with jointly G. Taguchi, T. C. Hsiang, et al.

"Impact of Measurement Errors on Quality, Yield and Risks," with J. E. Walker, American Statistical Association (ASA) Annual Meeting, Las Vegas, August 1985.

"On the All-or-None Sampling Plan," (1985), with T. C. Hsiang, American Statistical Association (ASA) Annual Meeting, Las Vegas, August 1985.

"Statistical Process Variation," invited talk at American Society of Quality Control (ASQC), Northern New Jersey Chapter, 1985.

"Optimal Time to Release Software," invited talk, ORSA/TIMS Conference, Miami, May 1986.

"Quality Assurance by Supplier Data," with A.A. Dolinsky and T. C. Hsiang, American Statistical Association (ASA) Annual Meeting, Chicago, August 1986.

"Process Quality Improvement: Statistical Techniques," invited talk, National Communications Forum, Chicago, October 1989.

"On Exact Bayesian Estimations of System Reliability form Component Test Data," invited talk, ORSA/TIMS Conference, 1990.

"Process Quality Improvement: Statistical Techniques (A Tutorial)," invited talk, National Communications Forum, Chicago, October 1990.

"A DSS for Vendor Evaluation using Multiattribute Utility Theory with Uncertain Parameters," invited talk, The 4th International Statistical Quality Control Workshop, Baton Rouge, LA, May 1990.

"Bayes Confidence Interval for Reliability of Large Series Systems with Highly Reliable Components," invited talk, ORSA/TIMS Conference, San Francisco, November 1992.

"Variance Estimation on the Aggregate Utility in an Additive Utility Model with Interval Weights," (1992) with P. Lam, T. Eppel, and H. Moskowitz, ORSA/TIMS Conference, San Francisco, November 1992.

"Validating Supplier's Quality Data in a Continuous Manufacturing Process," invited talk, ORSA/TIMS Conference, Los Angeles, November 1991.

"Distribution of Aggregate Utility in Multiattribute Utility Models with Uncertain Parameters," invited talk, with P. Lam, and H. Moskowitz, ORSA/TIMS Conference, Los Angeles, November 1991.

"Control Charts for Dependent and Multivariate Processes," The 5th International Conference on Intelligent Statistical Quality Control, Osaka, Japan, September 1994.

"Control Charts for Dependent and Independent Measurements Based on Bootstrap Methods," INFORMS Annual Conference, New Orleans, October 1995.

"Improving Quality via Matching: Integrating Supplier and Manufacturer Quality Performance," Keynote speaker, International Conference in Business Administration, Taipei, June 6, 1997.

"SPC and Bootstrap Methods," Invited speaker, Workshop in Industrial Statistics,

sponsored by National Science Council (Taiwan) and Academic Sinica, April 10, 1998.

"Minimum Cost Adjustment Policy for the Metallic Film Thickness," presented at the National Center for Theoretical Sciences, Hsing-Chu City, Taiwan, May 30, 2013.

"Optimal Design of Accelerated Degradation Tests for Wiener Degradation Processes with Budget Constraint and Time-Censoring," presented at the Joint Statistical Meeting, Baltimore, MD, July 30, 2017.

"Minimum Cost Control Policy for the Metallic Film Thickness of Computer Connector Terminals." 2016 Workshop on Big and Small Data in SQC and Reliability Analysis. At National Cheng-Kung University, sponsored by National Theoretical Center (Mathematical Science).

"High Dimensional Categorical Data Clustering with Applications to Reliability," invited talk, Conference on Advances in Reliability, sponsored by Academia Sinica and National Tsing-hua University, Taiwan. 12/16/2018.

Invited talk, 2023 Institute of Mathematical Statistics (IMS) International Conference on Statistics and Data Science (ICSDS). "Clustering High-Dimensional Noisy Categorical and Numerical Data with Applications in Reliability," December 18-21, 2023, Lisbon, Portugal.

OTHER PROFESSIONAL ACTIVITIES:

Chair, invited paper session on "Statistics and Insurance," International Conference in Insurance and Applied Statistics, Taipei, July 1998.

Invited discussant on "Estimation of Parameters of Cox's Model with Censored Covariates," by Y. C. Chun, International Conference in Insurance and Applied Statistics, Taipei, July 1998.

Chair, invited paper session on "Analytical Methods in Quality Management," at 1991 ORSA/TIMS National Meeting, Anaheim, CA.

Chair, contributed paper session on "Statistical Process Control," at 1990 ORSA/TIMS National Meeting, Philadelphia.

Chair, invited paper session on "Quality Control/Assurance-Methods and Applications," at 1987 ORSA/TIMS National Meeting, New Orleans.

Organizer, Invited Paper Session on "Complex Risk Structures or Constraints of Reliability of Systems," Joint Statistical Meeting, July 29-August 3, 2017, Baltimore, MD.

Referee for Naval Research Logistics, European Journal Operational Research, Communications in Statistics, Journal of American Statistical Association, Management Science, Operations Research, Technometrics, IIE Transactions, Journal of Multivariate Analysis, IEEE Transactions on Reliability, Statistica Sinica, International Quality and Reliability

Engineering, Opsearch, Asia Pacific Journal of Quality Management, AIChE Journal (American Institute of Chemical Engineering), Journal of Statistical Planning and Inference, Production and Operations Management, American Journal of Mathematical and Management Sciences, Journal of Nonparametric Statistics.

PH. D. DISSERTATION CHAIR and CO-CHAIR at Purdue University:

Multi-Criteria Decision Analysis (1998): Co-chair (1)
Mathematical/Computational Finance (2002): Co-chair (1)
Statistics (2007): Chair (Tsing-Hua University, 1)
Quantitative Methods: Co-chair (2009), Co-chair (2012), Chair (2016), Co-chair (2016)
Co-chair (2017), Co-chair (expected 2021)

GRADUATE COMMITTEE MEMBER:

Ph.D. Dissertation Committee member (at Purdue University: Quantitative Methods,
Strategic Management, Agriculture Economics (Jay Akridge), Consumer Sciences) – 21
Ph.D. Dissertation Committee member (at National Tsing-Hua University) – 2
M.S.   Thesis Committee member (at National Tsing-Hua, Chao-Tung and Cheng-Chi Universities,
Taiwan) - 6

CONSULTING EXPERIENCE:

Northern Telecommunications Inc., Research Triangle Park, N.C.
General Cable Company, Lexington, K.Y.
AT&T Technology - Major AT&T manufacturing works at N. Andover, MA, Columbus,
OH, Oklahoma City, OK, Dallas, TX, Atlanta, GA, and Omaha, NE.
Corning Glass Company, Rochester, N.Y.
Bell Regional Telephone Companies - Bell Atlantic, NYNEX, Southwestern Bell
Corporation, BellSouth, Pacific Bell, and US WEST.
Eli Lilly Company, Canton Plant, IN.

SERVICE ACTIVITIES AND OTHER ACTIVITIES:

Master's Admission Committee, Krannert Graduate School of Management, Purdue University
(Krannert MBA1984-2000, GISMA 2005-2011)
Ph.D. Review Committee, Krannert Graduate School of Management, Purdue University (1999)
Chairman of Statistical Committee, Department of Mathematics, Statistics, and Computer
Science, Marquette University (1982-84).
Member of the Honor Society of Phi-Kappa-Phi.
Graduate Student Senator, Bowling Green State University (1980-81).
Scholarships, Soochow University (1970-71, 1971-72).
Chairman, The Society of Business Mathematics, Soochow University (1970-1971).
University Basketball Team member, Soochow University (1969-1973).

REFERENCES: Upon request.