VITA

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CONTACT INFORMATION:

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EDUCATION:

Institution	Dates	Degree (Subject)
Purdue University	1967-70	Ph.D. (Statistics)
Purdue University	1965-67	M.S. (Statistics)
St. Louis University	1961-65	B.S. (Mathematics)

ACADEMIC EXPERIENCE:

Institution	Dates	Rank
New Mexico State University	1970-75	Assistant Professor
Stanford University	1974, 75 Summers	Visiting Assistant Professor
Arizona State University	1975-1984	Associate Professor
Arizona State University	1984-2010	Professor
Arizona State University	2010-present	Professor Emeritus

GRANTS:

Institution (Employer)	Dates	Topic
Department of Energy (Co-Principal Investigator)	1981-83	Quantification of Ecological Responses to Perturbations
National Science Foundation (Co-Principal Investigator)	2000-05	IGERT - Musculo-Skeletal/Neural Adaptations in Form and Function

CONSULTING EXPERIENCE:

Institution (Employer)	Dates	Topic
Arizona Attorney General's Office	1980,82,83,87,98	Pyramid Schemes
Arizona Blood Services	June 1981	ALT Levels
Motorola	1983-1996	IC Data Analysis
AZ Lottery	2004-2005	Random Number Generators
Tempe Police Dept.	2005	Profiling Case
Texas Lottery Commission	2007-present	Analysis of Lottery Data

I have consulted on statistical problems with faculty and/or students from the Departments of Psychology, Educational Psychology, Sociology, Life Sciences, Chemistry, Geology, Physics, Anthropology, Nursing, Economics, Law, Industrial Engineering and Mathematics at Arizona State University.

ADMINISTRATIVE EXPERIENCE:
Associate Chair, Director of Graduate Studies, Department of Mathematics, 1991-1995
Director of the Committee on Statistics, 1996-2000, 2003-2005.
Co-Director of the Committee on Statistics, 2006-2010.

AWARDS, SCHOLARSHIPS, HONOR SOCIETIES:
> Four Year Scholarship—St. Louis University 1961-65
> NASA Fellowship—Purdue University 1965-68
> Member of Sigma Xi
> Listed in *American Men and Women of Science*
> Arizona Chapter of the American Statistical Association:
> > Outstanding Member Award 1989
> ASU Department of Mathematics Wexler Teaching Award 1991
> Fellow – American Statistical Association – Elected - 2008

MEMBERSHIP IN SCIENTIFIC AND PROFESSIONAL SOCIETIES:
> Institute of Mathematical Statistics
> American Statistical Association
> American Association for Advancement of Science
> American Society for Quality

AREAS OF TEACHING AND RESEARCH INTEREST:
> Teaching Area—Statistics (Mathematical and Applied)
> Research Area—Multivariate Statistical Analysis, Nonparametric Methods

PUBLICATIONS:

Chapters in Collected Works:

Multivariate Analysis of La Riera Industries and Fauna (with G.A. Clark, L. Straus and R. Jewett). Chapter XIX of *La Riera Cave: Stone Age Hunter-Gather Adaptations in Northern Spain*. Edited by L. Straus and G.A. Clark; ARP #36, pp 315-350 (1986).

Effects of Early Rearing History on Growth and Behavioral Development of Captive Chimpanzees (*Pan troglodytes*) (with S. M. Howell, M. Schwandt, J. Fritz, M. W. Marzke, and J. Murphy). Chapter 16 of *Nursery Rearing of Nonhuman Primates in the 21st Century*. Edited by G. P. Sackett, G. C. Ruppenthal, and K. Elias. Springer, New York, pp 313-350, (2006).

Papers in Refereed Journals:

1. An approximation to the distribution of the largest root of a complex Wishart matrix (with K.C.S. Pillai), *Annals of the Institute of Statistical Mathematics* **23**: 89-96 (1971).

2. On the exact distribution of Hotelling's generalized T_0^2 (with K.C.S. Pillai), *J. of Multivariate Analysis* **1**: 90-107 (1971).

3. The max trace-ratio test of the hypothesis $H_0: \Sigma_1 = ... = \Sigma_k$ (with K.C.S. Pillai), *Communications in Statistics* **1**: 57-80 (1973).

4. On the products of powers of generalized Dirichlet components with an application (with G.S. Rogers), *Canadian Journal of Statistics* **3**: 159-60 (1973).

5. The max *U*-ratio and likelihood ratio test of equality of several covariance matrices (with K.C.S. Pillai), *Communication in Statistics* **3**: 29-53 (1974).

6. Testing and estimation when a normal covariance matrix has intraclass structure of arbitrary order (with G.S. Rogers), *Communication in Statistics* **3**: 343-59 (1974).

7. Initial attitude differences among successful, procrastinating and withdraw-from-course students in a personalized system of statistics instruction (with F.L. Newman, et al), *Journal for Research in Mathematics Education* **5**: 105-13 (1974).

8. A personalized system of instruction in an undergraduate mathematics service sequence (with H.E. McKean and F.L. Newman), *American Mathematical Monthly* **81**: 767-75 (1974).

9. Some likelihood ratio tests when a normal covariance matrix has certain reducible linear structures (with G.S. Rogers), *Communications in Statistics* **4**: 537-554 (1975).

10. Inference concerning the mean vector when the covariance matrix is totally reducible, *Journal of the American Statistical Association* **71**: 996-99 (1976).

11. Explicit maximum likelihood estimates for certain patterned covariance matrices (with G.S. Rogers), *Communications in Statistics* **A6**: 121-133 (1977).

12. A singular distribution related to the normal (with G.S. Rogers), *Sankhya* **39B**: 299-302 (1977).

13. On testing a multivariate linear hypothesis when the covariance matrix and its inverse have the same pattern (with G.S. Rogers), *Journal of the American Statistical Association* **73**: 203-207 (1978).

14. Linear nearest neighbor analysis (with B.L. Stark), *American Antiquity* **46**: 284-300 (1981).

15. The linear nearest neighbor statistic, *Biometrika* **69**: 477-80 (1983).

16. Formative period political differentiation in the southern valley of Mexico: a comment on Steponaitis (with N.W. Ackerly), *American Anthropologist* **86**: 976-85 (1984).

17. Tree-ring variation in western larch (larix occidentalis) exposed to sulfur dioxide emissions (with C.A. Fox, W. Kincaid, T. Nash, H. Fritts), *Canadian Journal of Forest Research* **16**: 283-92 (1986).

18. Application of statistical design and response surface methods to computer-aided VLSI device design (with A. Alvarez, B. Abdi, H. Weed, J. Teplik, E. Herald), *IEEE CAD/CAS* 7: 272-228 (1988).

19. Application of statistical design and response surface methods to computer-aided VLSI device design II: desirability functions and Taguchi methods (with J. Teplik, H. Weed, N. Tracht and T. Alvarez), *IEEE Transactions on Computer-Aided Design* **10**: 103-115 (1991).

20. Grandparent strengths and need inventory (with P. Collinsworth, R. Strom and S. Strom), *Educational and Psychological Measurement* **51**: 785-792 (1991).

21. Validating the probability of paternity (with D. Kaye, T. Vyvial), *Transfusion* **31**: 823-828 (1991).

22. Weight gain in captive chimpanzee infants: comparisons by sex, rearing and colony (with M. Marzke and J. Fritz), *American Journal of Primatology* **38**: 133-144 (1996).

23. Comparative analysis of weight gain, hand/wrist maturation and dental emergence rates in chimpanzees aged 0-24 months from varying captive environments (with M. Marzke, D. Hawkey, S. Su, J. Fritz, P. Alford), *American Journal of Physical Anthropology* **99**: 175-190 (1996).

24. Influence Function and Maximum Bias of Projection Depth Based Estimators. (with Y. Zuo, H. Cui), *Annals of Statistics* **32**: 189-218 (2004).

25. Knot Selection for Least-squares and Penalized Splines. (with S. Spiriti, R. Eubank, P. Smith), *Journal of Statistical Computation and Simulation* **83**: 1020-1036 (2013).

26. Using RngStream for Parallel Random Number Generation in C++ and R. (with A. Karl, R. Eubank, J. Milovanovic, M. Reiser), *Computational Statistics* **29**: 1301-1320 (2014).

Papers in Conference Proceedings:

1. Evaluation of some aspects of a PSI introductory statistics course (with G.S. Rogers), in *Innovative Teaching Methods in Introductory College Mathematics*. Editors: M.J. Hassett and R.B. Thompson. 79-86 (1977).

2. Introduction to experimental design and statistical analysis (with M.J. Hassett), in *Proceedings of the Rocky Mountain Mathematics Consortium Conference on Evaluations of Introductory College Mathematics Programs*. Editors: T.L. Sherman and M.J. Hassett. 18-26 (1981).

3.   Optimization of advanced bipolar ECL gates through statistical circuit simulation (with E. Herald and R. Parmar), *Proceedings of the IEEE Bipolar Circuits and Technology Meeting*, 217-220 (1989).

TEXT BOOK

Three modular chapters on multiple regression analysis, design of experiments and analysis of variance to supplement Neil Weiss' *Introductory Statistics 10th Edition*.
(These modules are in their sixth edition and are revisions of the ones originally published in 1999 for the 5th Edition of Weiss' *Introductory Statistics*. They are available on the web.)

Multiple Regression Analysis (Module A), 1999, 2002, 2005, 2008, 2012, 2015 Addison-Wesley - 92 pages

Model Building In Regression (Module B), 1999, 2002, 2005, 2008, 2012, 2015 Addison-Wesley, 259 pages

Design Of Experiments And Analysis Of Variance (Module C), 1999, 2002, 2005, 2008, 2012, 2015 Addison-Wesley, 172 pages

UNPUBLISHED TECHNICAL REPORTS:

Notes on the distributions of characteristic roots and functions of characteristic roots of certain matrices in multivariate analysis (with N.A.S. Crowther), Technical Report No. 92, Stanford University, Department of Statistics, 1974, 64p.

On the exact non-null distribution of the characteristic roots of $S_1 S_2^{-1}$ (with N.A.S. Crowther), Technical Report No. 88, Stanford University, Department of Statistics, 1974.

Some tests for assessing randomness in one or more dimensions (with M.F. Driscoll), Technical Report No. 55, Arizona State University, Department of Mathematics, 1981.

Comments regarding the use of endcount test in the analysis of 2^N factorial designs, Technical Report No. 22, Bipolar Technology Center, Motorola, Inc., 1983.

Use and analysis of split-lot experiments for assessing IC manufacturing processes (with T. Alvarez), Technical Report, Bipolar Technology Center, Motorola, Inc., 1983.

MASTERS STUDENTS

M. Salami (1987) Power Transformations in Analysis of Variance.
Y. Pang (1988) A Comparison of Tests for Equality of Two Covariance Matrices Using
        Robust Estimates.
F.K. Wang (1990) Confidence Intervals for the Mean After a Fitted Power Transformation.
H. Shahriari (1991) Multivariate Tests of Normality Based on Angles.
R. Aultman (1992) Analogues of the Kolmogorov-Smirnov and Cramer-Von Mises Tests
        for the K Sample Problem.

S. Schulze (1992) On Tests of Symmetry About an Unknown Center.
S. Su (1993) Nonparametric Modeling and Comparison of Chimpanzee Growth Curves.
F. Schineller (1994) High Breakdown Local Regression Smoothing.
J. Hui (1996) Robust Analysis of Variance: High Breakdown F Tests in the One-Way
    ANOVA Model.
K. Stout (1997) Comparison of Tests for Heteroscedasticity in Multiple Linear Regression
    Analysis.
T. Zalupski (1998) A Comparison Study: Principal Components Regression and Partial
    Least Squares
M. Kumar (2000) Incorporation of Loess Smoothing in Partial Least Squares for
    Modeling Nonlinear Relationships.
T. Yu (2000) Robust Forward Selection in Regression Analysis.
V. Vakarchuk (2001) Testing Equality of Variances with Correlated Variables.
M. Odmann (2001) Nonparametric Comparison of Regression Curves: A Monte Carlo
    Study of Three Methods.
Y. Cheng (2002) A Comparison of All Subset Variable Selection Methods Based on
    Mallows's C_p and Its Modifications.
M. Keindl (2002) Evaluation of a Jackknife Method for Comparing Growth Curves
T. Gust (2002) Testing Equality of Two Quantiles.
J. Xia (2003) Subset Selection in Regression Using Robust Versions of Mallows's C_p.
M. Jiang (2004) The Q_{kp} Statistic for All Subsets Discriminant Analysis.
F. Li (2005) Case Deletion Influence Diagnostics for Multicollinearity
T. Xu (2005) Subset Selection in Regression Using Pseudo-F Based RT_p Method
J. Gong (2007) Evaluation of Several Tests for Common Slope in the Measurement Error
    Model
S. Steele (2007) Comparison of Six Methods of Fitting a Straight Line When Both
    Variables are Subject to Error
A. Rivera (2009) Comparisons of Robust Estimates for the Simple Linear Regression
    Line Whenever There Are Errors in Both Y and X and Outliers Are Present
S. Russell (2009) A Simulated Comparison of Nonparametric Dispersion Tests
E. Hassler (2009) Least Area Regression with Errors in Predictor and Response
S. Abdulla (2010) Diagnostics used by SAS PROC CLUSTER for Determining Clusters
H. Li (2010) Testing Equality of Correlation Coefficients Using Dependent Estimates

DOCTORAL STUDENTS

K. Hong – (1998) Robust Multivariate Analysis: Principal Components Analysis and
    Discriminant Analysis.
S. Spiriti – 2008 (co-chair with R. Eubank) Random Search Optimization for Free-Knot
    Splines and P-Splines
M. Zuo – (2010) Gamma Latent Variable Model For Nonnegative Matrix Factorization
J. Milovanovic – (2011) (co-chair with M. Reiser) Chi-Square Orthogonal Components
    for Assessing Goodness-of-fit of Multidimensional Multinomial Data
J. Li – (2012) Multivariate Generalization of Reduced Major Axis Regression