

ANURADHA ROY

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1. CURRENT ACADEMIC RANK:

Associate Professor.

2. AREAS OF INTEREST:

Applied Statistics, Multivariate Analysis, Discriminant Analysis/Pattern Recognition, Mixed Effects Models and Multivariate Repeated Measures data, Missing Data, Statistical Consulting and Statistical Computing. *Areas of application include Medical and Biomedical Sciences; and Engineering application, like Steganography Analyses.*

3. EDUCATION:

- Ph.D. 2002, Applied Statistics, Oakland University, Rochester, Michigan, USA.
Dissertation Title: Some Contributions to Discrimination and Classification with Repeated Measures Data with Special Emphasis on Biomedical Applications.
- M.Stat. (MS) 1981, Advanced Probability and Mathematical Statistics, Indian Statistical Institute, Calcutta, India.
- B.Sc. (BS) 1978, Mathematics (honors), Presidency College, Calcutta University, India.

4. EMPLOYMENT HISTORY:

Associate Professor, Dept. of Management Science and Statistics, The University of Texas at San Antonio, San Antonio, TX, 09/2008 – Present.

Assistant Professor, Dept. of Management Science and Statistics, The University of Texas at San Antonio, San Antonio, TX, 09/2002 – 08/2008.

Instructor, Dept. of Mathematics and Statistics, Oakland University, Rochester, MI, 05/2002 - 06/2002.

Graduate Teaching Associate, Dept. of Mathematics and Statistics, Oakland University, Rochester, MI, 01/1998 – 04/2002.

Counselor, Mathematics Summer Camp, Oakland University, 1998, 1999.
Mentored gifted high school students in advanced mathematics courses.

Research Assistant, Effectiveness Research, Center of Health Care Division Wayne State University School of Medicine, MI, 05/2000 –08/2000.

Before that over a period of almost 15 years I worked at academic institutions and Government agencies in India and contributed in the following areas.

Analogue Speech Processing:

- Developed a Hierarchical Perception Linked Model (HPLM) for machine recognition of vowels with the help of first two Formant frequencies F1 & F2. The model has the advantage that it naturally converts an essentially multiclass multiparameter classification problem into two-class single parameter problem at each level.
- The HPLM was extended to recognize the unaspirated plosives in CV context and also to recognize semi-vowels and nasals.
- Developed an expert system for isolated word recognition, independent of the number of speakers and the size of the lexicon.

Digital Speech Processing:

- Developed a method based on a discriminant function to discriminate speech /non-speech region in a noisy speech signal.
- Applied different filtering processing techniques (Wiener filtering, Kalman filtering etc.) to process the speech signal, which was fully submerged in noise.
- Applied ARMA and AR models to get the spectrum of the speech signal as well as the first two formants in the connected speech.

5. INSTRUCTIONAL ACTIVITIES:

Courses Taught:

The University of Texas at San Antonio, TX.

STA 1053 Basic Statistics (undergraduate): Fall 2003, Spring 2009, Spring 2010, Fall 2010
Spring 2011, Summer 2011, Fall 2011,
Spring 2012

STA 3013 Multivariate Analysis for the Life and Social Sciences (undergraduate): Fall 2003,
Fall 2005, Fall 2007, Fall 2009

STA 3513 Probability and Statistics (undergraduate): Fall 2002, Spring 2003, Spring 2004,
Fall 2004, Spring 2005

STA 3533 Probability and Random Process (undergraduate): Spring 2010

STA 3543 Statistics and Experimental Design for Computer Science (undergraduate):
Spring 2006, Fall 2006, Spring 2007, Spring 2008

STA 4643 Introduction to Stochastic Processes (undergraduate): Spring 2004, Spring 2006

STA 4713 Applied Regression Analysis (undergraduate): Fall 2005

STA 5103 Applied Statistics (graduate): Spring 2009

STA 5713 Foundation of Linear Models (graduate): Fall 2002, Fall 2004, Fall 2006, Spring 2008

STA 5723 Theory and Application of Linear Models (graduate) Spring 2005

STA 5813 Applied Multivariate Statistics (graduate): Spring 2003, Spring 2007, Fall 2010

STA 7033 Multivariate Statistical Analysis (doctoral): Fall 2007, Fall 2008, Fall 2009

STA 7723 Advanced Linear Models (doctoral): Fall 2008

STA 7813 Advanced Multivariate Analysis (doctoral): Fall 2010

Oakland University, MI.

Spring 2002: Linear Programming/ Elementary Functions (undergraduate)

Fall 1998 –Winter 2002: Elementary Algebra, Intermediate Algebra (undergraduate)

Invited Lectures:

The University of Texas at San Antonio, TX.

- Delivered a lecture on “The Time Dimension in Research” to the students of the COM 2213, Foundations of Communication class on Feb 9, 2004.
- Delivered a short lecture on “English Language and Cultural Experience” to the students of the COM 3553, Intercultural Communication class on Oct 3, 2002.
- Delivered a short lecture on “Gender, Culture and Communication” to the students of the COM 3083, Language and Communication Theory class on Nov 19, 2002.

Workshop Attended:

- Attended a teaching workshop on Jan 4, 2002 at Oakland University, Rochester, MI- 48309.
- Attended a workshop “Pathways to the Future” on August 10-11, 2002 in New York City.
- Attended the “Third Annual Provost’s Academy on Critical Thinking”, Evidence-based Teaching: Promoting Critical Thinking, Writing and Deep Learning on May 11-13, 2011 at UTSA HemisFair Park, San Antonio, TX.
- Attended a professional development workshop “Creating a Professional Portfolio” on October 14, 2011 at UTSA, San Antonio, TX.

External Evaluator for Dissertations:

<u>Year</u>	<u>Student Name</u>	<u>Dissertation Title</u>	<u>Degree Completed/ In Progress</u>
2008	Shyamal Kumar Das Mandal	Role of Shape Parameters in Speech Recognition: A Study On Standard Colloquial Bengali (SCB)	Ph.D. in Elect. & Telecom. Eng. Jadavpur Univ., Calcutta, India. -- Completed
2007	Saibal Kumar Pal	Development of Techniques for Protection and Analysis of Hidden Digital Information	Ph.D. in Computer Sc. Delhi Univ., India -- Completed

Theses and Dissertations Supervised:

<u>Year</u>	<u>Student Name</u>	<u>Thesis Title</u>	<u>Degree Completed/ In Progress</u>
2008	Christopher Louden	Classification of Data under Autoregressive Circulant Covariance Structure with Comparisons to Compound Symmetric Covariance Structure	M.S. in Statistics UTSA -- Completed
2005-06	Joseph R. Roy	The Constant Rate Effect in the Spread of Syntactic Change:	M.S. in Statistics UTSA.

Applications of Alternating Logistic Regressions in Historical Linguistic Repeated Response data -- Completed

Theses and Dissertations Committees:

Committee/board member in the following committees.

<u>Year</u>	<u>Student Name</u>	<u>Thesis Title</u>	<u>Degree Completed/ In Progress</u>
2010- Present	Jermaine Vesey	Exploring the Role of Motivation on Workplace Outcomes	Ph.D. in Management UTSA. -- In Progress
2008-09	Mei-Ching Chen	Image Security and Recognition System	Ph.D. in Elect. & Computer Eng. UTSA. -- Completed
2004-05	Jonathan A. Vance	A Continuous Emission Tracking And Predictive Model for Emissions Reduction and Process Improvement.	M.S. in Statistics UTSA. -- Completed

Thesis Supports:

Provided consulting assistance in developing the statistical models used in the following thesis. Not a member of the thesis committee.

<u>Year</u>	<u>Student Name</u>	<u>Thesis Title</u>	<u>Degree Completed/ In Progress</u>
2003-04	Octavio Garza	Food Service Establishment Waste-water Characterization and Management Practice Evaluation.	M.S. in Civil Eng. Texas A&M Univ. -- Completed

Honors Credits:

<u>Semester</u>	<u>Student Name</u>	<u>Course</u>
Fall 2005	Ashok K. Chaurasia	STA 3013 (Multivariate Analysis for the Life and Social Sciences)
Spring 2006	Ashok K. Chaurasia	STA 4643 (Introduction to Stochastic Processes)

6. AWARDS, HONORS AND RECOGNITIONS:

- Awarded the *Franklin V. Taylor memorial certificate of merit for the Best Paper and Oral Presentation in 2009 IEEE International Conference on Systems, Man, and Cybernetics.*
- Faculty Research Award from the University of Texas at San Antonio, 2006.
- College of Business Summer Research Grant from the University of Texas at San Antonio, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010 and 2011.

- Will appear in *Who'sWho in the World*, 2010.
- Appeared in *Who'sWho in America*, 2009, 2010 (will appear).
- Appeared in *Who'sWho in Healthcare*, 2007 Web Version, 2008.
- Appeared in *Who'sWho among America's Teachers & Educators™*, 2007.
- Appeared in *Who'sWho of American Women 2006 (25th Silver Anniversary Edition)*, 2007, 2008-2009, Appeared in 2010-2011 Edition.
- Appeared in *Academic Keys Who'sWho in Business Education*, 2006.
- Graduate Research Grant from the Oakland University Research Committee, 2001.
- Certificate of merit (6 times) for outstanding academic achievement in Oakland University, Dept. of Mathematics and Statistics.
- “Ramanujam Award” for the best academic performance, India.
- National Merit Scholarship (Twice), India.
- Prize for overall good academic record in Presidency College, Calcutta, India.
- Prize in the Intercollegiate Essay competition on Astronomical work of Aryabhata I, Calcutta University, India.

7. PUBLICATIONS:

Refereed Statistical Journal Articles:

1. Leiva R. and Roy Anuradha, (Published Online, 2011), “Linear discrimination for three-level multivariate data with separable additive mean vector and doubly exchangeable covariance structure”, *Computational Statistics and Data Analysis*, DOI: 10.1016/j.csda.2011.10.007.
2. Roy Anuradha and Fonseca M. (Forthcoming, 2011), “Linear Models with Doubly Exchangeable Distributed Errors”, *Communications in Statistics – Theory and Methods*.
3. Roy Anuradha and Leiva R. (Forthcoming, 2011), “Classification Rules for Multivariate Repeated Measures Data with Equicorrelated Correlation Structure on both Time and Spatial Repeated Measurements”, *Communications in Statistics – Theory and Methods*.
4. Roy Anuradha and Leiva R. (2011), “Estimating and Testing a Structured Covariance Matrix for Three-level Multivariate Data”, *Communications in Statistics – Theory and Methods*, 40(11), 1945-1963 (cited 1 time).
5. Leiva R. and Roy Anuradha, (2011), “Linear Discrimination for Multi-level Multivariate Data with Separable Means and Jointly Equicorrelated Covariance Structure”, *Journal of Statistical Planning and Inference*, 141(5), 1910-1924 (cited 2 times).
6. Leiva R. and Roy Anuradha, (2011), “A Quadratic Classification Rule with Equicorrelated Training Vectors for Non-random Samples”, *Communications in Statistics – Theory and Methods*, 40(2), 213-231 (cited 1 time).
7. Loudon C. (M.S. student) and Roy Anuradha, (2010), “Classification Rules under Autoregressive and General Circulant Covariance”, *Communications in Statistics – Theory and Methods*, 39(18), 3294-3315.
8. Leiva R. and Roy Anuradha, (2009), “Classification Rules for Triply Multivariate Data with an AR(1) Correlation Structure on the Repeated Measures over Time”, *Journal of Statistical Planning and Inference*, 139(8), 2598-2613 (cited 3 times).

9. Roy Anuradha (2009), "An Application of Linear Mixed Effects Model to Assess the Agreement between Two Methods with Replicated Observations", *Journal of Biopharmaceutical Statistics*, 19(1), 150-173 (cited 2 times).
10. Roy Anuradha and Leiva R. (2008), "Likelihood Ratio Tests for Triply Multivariate Data with Structured Correlation on Spatial Repeated Measurements", *Statistics & Probability Letters*, 78(13), 1971-1980 (cited 10 times).
11. Roy Anuradha (2008), "Computation Aspects of the Parameter Estimates of Linear Mixed Effects Model in Multivariate Repeated Measures Set-up", *Journal of Applied Statistics*, 35(3), 307-320 (cited 2 times).
12. Roy Anuradha and Leiva R. (2007), "Discrimination with Jointly Equicorrelated Multi-level Multivariate Data", *Advances in Data Analysis and Classification*, 1(3), 175-199 (cited 7 times).
13. Roy Anuradha and Khattree R. (2007), "Classification of Multivariate Repeated Measures Data with Temporal Autocorrelation", *Journal of Applied Statistical Science*, 15(3), 283-294.
14. Roy Anuradha (2006), "A New Classification Rule for Incomplete Doubly Multivariate Data using Mixed Effects Model with Performance Comparisons on the Imputed Data", *Statistics in Medicine*, 25(10), 1715-1728 (cited 11 times).
15. Roy Anuradha (2006), "Estimating Correlation Coefficient Between Two Variables with Repeated Observations using Mixed Effects Model", *Biometrical Journal*, 48(2), 286-301 (cited 20 times).
16. Roy Anuradha (2006), "Testing of Kronecker Product Structured Mean Vectors and Covariance Matrices", *Journal of Statistical Theory and Applications*, 5(1), 53-69 (cited 1 time).
17. Roy Anuradha and Khattree R. (2005), "A Study of Covariance Structures for Repeated Measures in the Context of Classification Analysis", *Journal of the Indian Statistical Association*, 43(2), 127-145.
18. Roy Anuradha and Khattree R. (2005), "Classification Based on Multivariate Repeated Measures with Time Effect on Mean Vector and an AR(1) Correlation Structure on the Repeated Measures", *Calcutta Statistical Assoc. Bulletin*, 57, 49-65 (cited 1 time).
19. Roy Anuradha and Khattree R. (2005), "On Implementation of a Test for Kronecker Product Covariance Structure for Multivariate Repeated Measures Data", *Statistical Methodology*, 2(4), 297-306 (cited 17 times).
20. Roy Anuradha and Khattree R. (2005), "On Discrimination and Classification with Multivariate Repeated Measures Data", *Journal of Statistical Planning and Inference*, 134(2), 462-485 (cited 12 times).
21. Roy Anuradha and Khattree R. (2005), "Discrimination and Classification with Repeated Measures Data under Different Covariance Structures", *Communications in Statistics-- Simulation and Computation*, 34(1), 167-178 (cited 6 times).
22. Roy Anuradha and Khattree R. (2003), "Tests for Mean and Covariance Structures Relevant in Repeated Measures Based Discriminant Analysis", *Journal of Applied Statistical Science*, 12(2), 91-104, (cited 16 times).

Refereed Biomedical, Medical and Other Scientific Journal Articles:

23. Nyman J. S., Roy Anuradha, Reyes M. J., and Wang X. (2009), “Mechanical Behavior of Human Cortical Bone in Cycles of Advancing Tensile Strain for Two Age Groups”, *Journal of Biomedical Materials Research: Part A*, 89(2), 521-529 (cited 4 times).
24. Oubre C. M., Roy Anuradha, Toner C. and Kalns J. (2007), “Retrospective Study of Factors Affecting Non-Healing of Wounds During Hyperbaric Oxygen Therapy”, *Journal of Wound Care*, 16(6), 245- 250 (cited 6 times).
25. Nyman J. S., Roy Anuradha, Tyler J. H., Acuna R. L., Gayle J. H. and Wang X. (2007), “Age-Related Factors Affecting the Postyield Energy Dissipation of Human Cortical Bone”, *Journal of Orthopaedic Research*, 25(5), 646- 655 (cited 24 times).
26. Nyman J. S., Roy Anuradha, Acuna R. L., Gayle H. J., Reyes M. J., Tyler J. H., Dean D. D. and Wang X. (2006), “Age-Related Effect on the Concentration of Collagen Cross-Links in Human Osteonal and Interstitial Bone Tissue”, *Bone*, 39(6), 1210-1217 (cited 13 times).
27. Nyman J. S., Roy Anuradha, Shen X. M., Acuna R. L., Tyler J. H. and Wang X. (2006), “The Influence of Water Removal on the Strength and Toughness of Cortical Bone”, *Journal of Biomechanics*, 39(5), 931-938 (cited 50 times).
28. Banerjee M., George J., Song E. Y., Roy Anuradha and Hryniuk W. (2004), “Tree-Based Model for Breast Cancer Prognostication”, *Journal of Clinical Oncology*, 22(13), 2567-2575 (cited 38 times).
29. Kalns J., Roy Anuradha, Loeffler C. and Wright J. K. (2004), “A Retrospective Evaluation of Digital Wound Imaging to Predict Response to Hyperbaric Oxygen Treatment”, *Ostomy/Wound Management*, 50(4), 36-48.
30. Roy Anuradha and Datta A. K. (1994), “A Hierarchical Perception Linked Model for Machine Recognition of Vowels in Telugu”, *Acustica*, 80(4), 406-412 (cited 2 times).
31. Datta A. K., Ganguly N. R., Roy Anuradha and Mukherjee B. (1991), “A Hierarchical Perception-Linked Model for Machine Recognition of Phonemes”, *Information Sciences*, 55, 259-269.
32. Datta A. K., Roy Anuradha and Ganguli N. R. (1987), “An Expert System for Key Syllable Based Isolated Word Recognition”, *Pattern Recognition Letters*, 6, 145-150 (cited 4 times).
33. Roy Anuradha (1986), “A Note on the Aerodynamic Force System on an Axis- Symmetric Body”, *Journal of Armament Studies*, 23-26.

Conference Proceedings (Refereed):

34. Chen M. C. (ECEng Ph.D. student), Roy Anuradha, Rodriguez B. M., Agaian S. S. and Philip Chen C. L. (2009), “An Application of Linear Mixed Effects Model to Staganography Detection”, 1782-1786, *Proceedings of the 2009 IEEE International Conference on Systems, Man, and Cybernetics*, San Antonio, Texas (cited 1 time).

(This paper was Nominated as one of the five finalists for the Franklin V. Taylor Memorial Award for the best paper and oral presentation in IEEE SMC 09, and Awarded the certificate of merit.)

35. Roy Anuradha and Leiva R. (2007), "Classification Rules for Multi-level Multivariate Data", *Proceedings of the 2nd International Conference on Innovative Computing, Information and Control*, Kumamoto City, Japan. (Indexed by EI Compendex) (cited 1 time).
36. Roy Anuradha and Khattree R. (2005), "Testing the Hypothesis of a Kronecker Product Covariance Matrix in Multivariate Repeated Measures Data", *Proceedings of the 30th Annual SAS Users Group International Conference (SUGI 30)*, Philadelphia (cited 10 times).
37. Roy Anuradha, Bhowmick B. K. and Datta A. K. (1984), "A Statistical Approach for Recognition of Vowels in Connected Speech", *Proceedings of the IEEE International Conf. on System Man and Cybernetics*, Bombay, India, 340-344.

Conference Proceedings (Non-refereed):

38. Roy Anuradha and Leiva R. (2008), "Testing of Hypothesis of a Structured Mean Vector for Three-level Multivariate Data with Structured Correlations on Repeated Measurements", *Proceedings of the American Statistical Association, Statistical Computing Section*, 1940- 1947.
39. Roy Anuradha (2007), "A Note on Testing of Kronecker Product Covariance Structures for Doubly Multivariate Data", *Proceedings of the American Statistical Association, Statistical Computing Section*, 2157- 2162.
40. Roy Anuradha (1993), "A Method to Discriminate Between Speech/ Non-Speech Region in a Noisy Speech Signal and Some Related Observations", *Proceedings of the 3rd International Conference on Advances in Pattern Recognition and Digital Techniques* at Indian Statistical Institute, Calcutta, India, 124-129.
41. Roy Anuradha (1993), "Discrimination Between Speech/Non-Speech Region in a Noisy Speech Signal Using the Direction Cosines along each Band of the Spectrum", *Proceedings of the Ninth International Congress of Cybernetics and Systems*, New Delhi, India, 93-98.
42. Roy Anuradha and Datta A. K. (1984), "A Perceptual Model for A.S.R.", *Proceedings of the International Conference on Computer Systems and Signal Processing*, Bangalore, India.

Book Chapters:

1. Roy Anuradha and Khattree R. (2007), "Classification Rules for Repeated Measures Data from Biomedical Research", In: Khattree R. and Naik D. N. (Eds) *Computational Methods in Biomedical Research*, 323-370 (cited 5 times).

Letters to the Editor:

1. Lee C. H., Dutilleul P. and Roy Anuradha (2010), "Models with a Kronecker Product Covariance Structure: Estimation and Testing", by Srivastava M. S., Von Rosen T. and Von Rosen D., *Mathematical Methods of Statistics*, 19(1), 88- 90.

Published Abstracts:

1. Wood M. A., Aherne N. J., Herden J. P., Dean J. L. Hill J. D., Last A., Everitt C., Fuller C. D., Roy Anuradha, Shakespeare T. P. (2009) "Fiducial Marker (FM) Matching Versus Bone Matching in Image Guided Intensity Modulated Radiation Therapy (IG-IMRT) of the Prostate Bed following

Radical Prostatectomy”, *Proceedings of the 51st annual meeting of American Society for Therapeutic Radiation and Oncology*.

2. Aherne N. J., Wood M. A., Herden J. P., Mincham S., Last A., Hill J. D., Fuller C. D. Roy Anuradha, Shakespeare T. P. (2009) “Fiducial Based Target Definition in Patients Undergoing Salvage IMRT following Prostatectomy”, *Proceedings of the Asian Oncology Summit, Poster Discussion, Preferred Papers, Genito Urinary*, # 205.
3. Neidre D. B., Nyman J. S., Roy Anuradha, Nelson M. J., Gutierrez G., Wang X. and Starnes J. W. (2007), “Treadmill Exercise Plus Statin Administration Increases Femoral Strength in Rats”, *Proceedings of the 53rd Annual Meeting of the Orthopaedics Research Society*, # 1397.
4. Reyes M. J., Nyman J. S., Roy Anuradha and Wang X. (2006), “Post-yield Energy Dissipation as Function of Strain in Middle and Old Aged Cortical Bone”, *Proceedings of the Annual Fall Meeting of the Biomedical Engineering Society*, # 1371.
5. Nyman J. S., Tyler J. H., Acuna R., L. Roy Anuradha and Wang X. (2005), “Age and Gender Differences in the Post-Yield Energy Dissipation of Cortical Bone”, *Proceedings of the Annual Fall Meeting of the Biomedical Engineering Society*, # 106. P1.40.
6. Nyman J. S., Tyler J. H., Roy Anuradha, DeLeon A. and Wang X. (2005), “The Effect of Age and Gender on the Post-Yield Energy Dissipation of Cortical Bone”, *Proceedings of the 51st Annual Meeting of the Orthopaedics Research Society*, # 0669.
7. Nyman J. S., Roy Anuradha, Shen X. M. and Wang X. (2004), “The Role of Water Distribution on the Strength and Toughness of Cortical Bone”, *Proceedings of the Annual Fall Meeting of the Biomedical Engineering Society*, # 1036.
8. Banerjee M., Song E. Y., Roy Anuradha, Du W. and Hryniuk W. (2001), “A Tree-Based Model for Breast Cancer Prognosis”, *Proceedings of the American Association for Cancer Research*, # 3092, Vol. 42, 576.

8. PRESENTATIONS AND PROFESSIONAL MEETINGS:

At the National and International Meetings:

1. Presented a paper by a coauthor at the Annual Meeting of the American Academy of Ophthalmology on the Retina Subspecialty Day on October 21, 2011 in Orlando, Florida. The title of the talk was “Effect of Combination Therapy with Anti-Vegf therapy and Dexamethasone Intravitreal Implant in Patients with Retinal Vein Occlusion”.
2. Presented a paper at the Section on Statistical Computing of the *Joint Statistical Meetings* on August 2, 2011 in Miami, Florida. The title of my talk was “Quadratic discrimination for multi-level multivariate data with separable means”.
3. Presented a paper at the Session 3B – Linear Algebra in Statistics *MAT-TRIAD 2011* on July 12, 2011 in Tomar, Portugal. The title of my talk was “Discriminant Analysis for Multi-level Multivariate Data”.

4. Presented a paper by a coauthor at Noveno Congreso Latinoamericano de Sociedades Estadística on October 20, 2010 in Valparaiso, Chile. The title of the talk was “Discrimination Linear Multivariate Multilevel Data and Removable Media Equicorrelacionada Jointly Covariance Structure”
5. Presented a paper at the Section on Statistical Computing of the Joint *Statistical Meetings* on August 5, 2010 in Vancouver, British Columbia, Canada. The title of my talk was “Estimating and Testing the Blocked Compound Symmetry Covariance Structure for Doubly Multivariate Data”.
6. Presented a paper at the Session XXVII – Statistical Inference in Mixed and Multivariate Linear Models part IV at LinStat 2010 on July 29, 2010 in Tomar, Portugal. The title of my talk was “Linear Models with Doubly Exchangeable Distributed Errors”.
7. Presented a paper by a coauthor at the *51st Annual meeting of American Society for Therapeutic Radiology and Oncology*, 2009 in Chicago, IL. The title of the talk was “Fiducial Marker (FM) Matching Versus Bone Matching in Image Guided Intensity Modulated Radiation Therapy (IG-IMRT) of the Prostate Bed following Radical Prostatectomy”.
8. Presented a paper by a coauthor (ECEng Ph.D. student) at the Session Image Processing/Pattern Recognition of the *2009 IEEE International Conference on Systems, Man, and Cybernetics* in October, 2009 in San Antonio, TX. The title of the talk was “An Application of Linear Mixed Effects Model to Staganography Detection”.
9. Presented a paper by a coauthor at the Section on Multivariate methods of the *Argentine Symposium XXXVII Stats* on October 9, 2009 in Catamarca Province, Argentina. The title of the talk was “Discriminant Analysis with Multiple Training Samples Obtained from Different Sources”.
10. Presented a paper for the poster session by a coauthor at the *Asian Oncology Summit* in April, 2009 in Singapore. The title of the talk was “Fiducial Based Target Definition in Patients Undergoing Salvage IMRT Following Prostatectomy”.
11. Presented a paper at *MAT-TRIAD 2009* on March 26, 2009 at the Mathematical Research and Conference Center of the Polish Academy of Sciences in Bedlewo, Poland. The title of my talk was “Linear Discrimination for Three-level Multivariate Data with Structured Mean Vectors and Doubly Exchangeable Covariance Structure”.
12. Presented a paper by a coauthor (M.S. student) at the *ENAR Spring Meeting* on March 16, 2009 in San Antonio, TX. The title of the talk was “Classification of Data under Autoregressive Circulant Covariance Structure”.
13. Presented a paper at the 8th Annual Hawaii International Conference on Statistics, Mathematics and Related Fields on January 14, 2009 in Honolulu, Hi. The title of my talk was “Does Dose Matter in Multiple Sclerosis Treatment? A Retrospective Study of Longitudinal Outcome Measurements of Magnetic Resonance Imaging and Count of Lesions”.
14. Presented a paper by a coauthor at the Section on Análisis Multivariado of the Octavo Congreso Latinoamericano de Sociedades Estadística on October 8, 2008 in Montevideo, Uruguay. The title of the talk was “Discriminación en el Modelo de Medidas Repetidas Multivariadas”.

15. Presented a paper at the Section on Government Statistics of the Joint *Statistical Meetings* on August 4, 2008 in Denver, CO. The title of my talk was “Classification Rules for Repeated Measures Data from Multiple Sources”.
16. Presented a paper for the poster session of the *Graybill Conference VII* on June 11, 2008 in Colorado State University, Fort Collins, CO. The title of my talk was “Still another Application of Linear Mixed Effects Model for Assessment of Agreement between Two Methods with Replicated Observations”.
17. Attended the *SAS Global Forum* on March, 2008 in San Antonio, TX.
18. Presented an invited paper by the session organizer at the special organized Session on Intelligent Technique for Time Series Data Mining of the 2nd *International Conference on Innovative Computing, Information and Control* on September 6, 2007 in Kumamoto City International Center, Kumamoto City, Japan. The title of the talk was “Classification Rules for Multi-level Multivariate Data”.
19. Presented a paper at the Section on Statistical Computing of the Joint *Statistical Meetings* on August, 2007 in Salt Lake City, Utah. The title of my talk was “Testing of Hypothesis of a Structured Mean Vector for Multi-level Multivariate Data with Structured Correlations on Repeated Measurements”.
20. Presented an invited paper at the *Conference of Texas Statisticians* on March 31, 2007 at Baylor University in Waco, TX. The title of my talk was “Classification Rules and Related Testing of Hypotheses for Multi-level Multivariate Data with AR(1) Correlation Structure on Repeated Measures over Time”.
21. Presented a paper at the *ENAR Spring Meeting* on March 12, 2007 Atlanta, Georgia. The title of my talk was “Classification Rules for Triply Multivariate Data with an AR(1) Correlation Structure on the Repeated Measures Over Time”.
22. Presented a Poster paper by a coauthor at the 53rd Annual Meeting of the *Orthopedics Research Society* on Feb 2007 in San Diego, California. The title of the talk was “Treadmill Exercise Plus Statin Administration increases Femoral Strength in Rats”.
23. Presented a paper by a coauthor in the Bone Mechanics Session of the Orthopedic & Rehabilitation Engineering track at the Annual *Fall Meeting of the Biomedical Engineering Society* on October 14, 2006 in Chicago. The title of the talk was “Post-yield energy dissipation as function of strain in middle and old aged cortical bone”.
24. Presented a paper at the Section on Statistical Computing (Mixed Models and Data Mining Session) of the *Joint Statistical Meetings* on August 7, 2006 in Seattle. The title of my talk was “A Note on a Testing of Hypothesis of a Kronecker Product Covariance Structure in Doubly Multivariate Data”.
25. Presented a paper by a coauthor in the Hard Tissue Mechanics/ Bone session of the Orthopaedic Bioengineering track at Annual *Fall Meeting of the Biomedical Engineering Society* on Sep, 2005 in Baltimore, MD. The title of the talk was “Age and Gender Differences in the Post-Yield Energy Dissipation of Cortical Bone”.

26. Presented a paper at the Section on Statistical Computing (Algorithm and Software) of the *Joint Statistical Meetings* on August 8, 2005 in Minneapolis, Minnesota. The title of my talk was "Estimating Correlation Coefficient between Two Variables with Repeated Observations using Mixed Effects Model".
27. Presented a paper in the Statistics and Data Analysis Section at the 30th Annual *SAS Users Group International (SUGI 30)* on April 12, 2005 in Philadelphia. The title of my talk was "Testing the Hypothesis of a Kronecker Product Covariance Matrix in Multivariate Repeated Measures Data".
28. Presented a paper at the Section on Missing Data in Longitudinal Data Analysis in the *ENAR Spring Meeting* on March 21, 2005 in Austin, TX. The title of my talk was "Classification of Multivariate Repeated Measures Data with Missing Values".
29. Presented a paper by a coauthor at the 51st Annual Meeting of the *Orthopedics Research Society* on Feb 2005 in Washington, D. C. The title of the talk was "The Effect of Age and Gender on the Post-Yield Energy Dissipation of Cortical Bone".
30. Presented a paper by a coauthor in the Hard Tissue Mechanics/ Bone session of the Orthopaedic Bioengineering track at Annual *Fall Meeting of the Biomedical Engineering Society* on Oct 16, 2004 in Philadelphia. The title of the talk was "The role of water distribution on the strength and toughness of cortical bone".
31. Attended the *Tripathi Conference* on October 8-9, 2004 at The University of Texas at San Antonio Downtown, San Antonio, TX.
32. Attended the Air Force Research Laboratory/ Human Effectiveness, Historically Black Colleges and Universities and Minority Institutions conference on Feb 27, 2004 at Brooks City-Base, San Antonio TX.
33. Presented a paper at the *Micro- JSM*, an ASA San Antonio chapter meeting, on Jan 22, 2004 in San Antonio, TX. The title of my talk was "Classification Rules for Repeated Measures".
34. Presented a paper at the *Joint Statistical Meetings* on Aug 3, 2003 in San Francisco, CA. The title of my talk was "Classification Rules for Repeated Measures".
35. Presented a paper by a coauthor at the *Wound Healing Societies national meeting*, on May 2003 in Seattle, WA. The title of the talk was "A Retrospective Evaluation of Digital Wound Imaging to Predict Response to Hyperbaric Oxygen Treatment".
36. Presented a paper at the *ENAR Spring Meeting* on Apr 1, 2003 in Tampa, FL. The title of my talk was "Digital Wound Imaging Enables Timely Identification of Chronic Non-healing Wounds Minimally Responsive to Hyperbaric Oxygen Treatment".
37. Presented a paper by a coauthor at *Ninth International Conference of Forum for Interdisciplinary Mathematics on Statistics Combinatorics and Related Areas* on Dec, 2002 in Allahabad, UP, India. The title of the talk was "Discrimination and Classification with Repeated Measures Data".
38. Attended the *Joint Statistical Meetings* on Aug, 2002 in New York, NY.
39. Presented a paper at *Fourth Biennial International Conference on Statistics, Probability and Related Areas* at Northern Illinois University, DeKalb, Illinois, on June 16, 2002. The title of my

talk was "Classification Methods for Repeated Measures Data with Applications to Cancer Studies".

40. Presented a paper at the *Joint Statistical Meetings* on Aug 7, 2001 in Atlanta, GA. The title of my talk was "Some Approaches to Discriminations and Classifications with Repeated Measures Data".
41. Presented a paper by a coauthor at the session Biostatistics and Epidemiology, Statistics 2001 Canada: The *Fourth Canadian Conference in Applied Statistics* on July, 2001 in Concordia University, Montreal, Canada. The title of the talk was "Recursive Partitioning for Predicting Breast Cancer Survival".
42. Presented a paper by a coauthor at the session Clinical Research 12 on March 27, 2001 at 2001 *AACR Annual Meetings* in New Orleans, LA. The title of the talk was "A Tree-Based Model for Breast Cancer Prognosis".
43. Presented a paper at the *8th Biennial CDC and ATSDR Symposium on Statistical Methods* on Jan 23, 2001 in Atlanta, GA. The title of my talk was "Comparing Two Goodness-of-Split Measures for Classification Trees: A Simulation Based Study".
44. Presented a paper at the *3rd International Conference on Advances in Pattern Recognition and Digital Techniques*, at Indian Statistical Institute, Calcutta, India in 1993. The title of my talk was "A Method to Discriminate Between Speech/ Non-Speech Region in a Noisy Speech Signal and Some Related Observations".
45. Presented a paper at the *Ninth International Congress of Cybernetics and Systems*, New Delhi, India in 1993. The title of my talk was "Discrimination Between Speech/Non-Speech Region in a Noisy Speech Signal Using the Direction Cosines along each Band of the Spectrum".
46. Presented a paper at the *International Conference on Computer Systems and Signal Processing*, Bangalore, India in 1984. The title of my talk was "A Perceptual Model for A.S.R.".
47. Presented a paper at the *IEEE International Conf. on System Man and Cybernetics*, Bombay, India in December, 1984. The title of my talk was "A Statistical Approach for Recognition of Vowels in Connected Speech".

At the universities:

48. Presented an invited paper at *Georgia State University*, on October 29, 2004. The title of my talk was "Effect of the Correlation Structures on Classification Rules for Repeated Measurements of Doubly Multivariate Data".
49. Presented an invited paper at *Oakland University Colloquium Series*, on July 22, 2004. The title of my talk was "Classification of Incomplete Doubly Multivariate Data with Mixed Effect Models".
50. Presented an invited paper at the *Tulane-LSU Biostatistics Seminar Series* on Jan 26, 2004 in New Orleans, LA. The title of my talk was "Discrimination and Classification of Doubly Multivariate Measurements with Application in Medical Diagnosis".
51. Presented a paper at *Oakland University Colloquium Series*, on Oct 11, 2001. The title of my talk was "On Discriminations and Classifications with Multivariate Repeated Measures Data".

9. PROFESSIONAL TRAINING:

1. Attended a course “Analysis of Longitudinal Data Using Antedependence Models” offered by Dale Zimmerman, *The University of Iowa*, at the *Joint Statistical Meeting* on August 3, 2010 in Vancouver, British Columbia, Canada.
2. Attended a course “Special Classes of Matrices: Positivity” offered by C. R. Johnson at the *MAT-TRIAD 2009*, Mathematical Research and Conference Center of the Polish Academy of Sciences in Bedlewo, Poland.
3. Attended a one-day course on “Hot Topics in Clinical Trials” offered by Scott Evans, Lingling Li, L.J. Wei and Marvin Zelen at the *Graybill Conference VII* on June 11, 2008 in Colorado State University, Fort Collins, CO.
4. Attended a one-day course on “Generalized Linear Mixed Models: Theory and Applications” offered by Dr. Oliver Schabenberger, SAS Institute, Inc, at the *Joint Statistical Meeting* on August 6, 2006 in Seattle, WA.
5. Attended a one-day course on “GLMM and GEE Modeling of Complex, Non-Gaussian, Correlated Data” offered by Drs. José Pinheiro and Edward Chao, at the *ENAR spring meeting* on March 20, 2005 in Austin, TX.
6. Attended a tutorial on “Quantile Regression” offered by Drs. Xuming He and Ying Wei, at the *ENAR spring meeting* on March 21, 2005 in Austin, TX.
7. Attended a one day traveling course on “Applied Nonlinear Statistical Methods”, offered by Dr. Timothy E. O’Brien on March 9, 2005 in San Antonio, TX. The course was arranged by the San Antonio Chapter of the *American Statistical Association (ASA)* and the ASA Council of Chapters.
8. Attended a one-day course on “Longitudinal and Incomplete Data” offered by Dr. Greet Verbeke, Katholieke Universiteit Leuven, and by Dr. Greet Molenberghs, Limburgs Universitar Centrum, on April 2, 2004 at *George Mason University*, Virginia.
9. Attended a short course on “Power and Sample Size Analysis Using New SAS/STAT Software” offered by Dr. John Castelloe, SAS Institute, Inc, at the *Joint Statistical Meeting* on Aug 6, 2003 in San Francisco, CA.
10. Attended a short course on “Multiple Imputation for Missing Data with SAS Software” offered by Dr. Yang C. Yuan, SAS Institute, Inc. at the *Joint Statistical Meeting* on Aug 6, 2003 in San Francisco, CA.
11. Attended a two-day workshop on “Nucleic Acid and Protein Sequence Analysis” on March 5 –6, 2003, at the *University of Texas at San Antonio*, TX.
12. Attended one-day short course on the “Introduction to Mixed Models for Longitudinal Studies” offered by Prof. Donald Hedeker at the *8th Biennial CDC and ATSDR Symposium* on Statistical Methods on Jan 22, 2001 in Atlanta, GA.
13. Attended a Research Workshop on “Classification and Large Data Sets (CLDS)” offered by Prof. David Hand on May 17-18, 2001 at University of Waterloo, Canada.

10. SERVICE:

Professional Service:

- Chair of the Session 7 at the MAT-TRIAD 2011 on July 13, 2011 in Tomar, Portugal.
- Reviewer of Book Proposal to SAGE publications, UK in 2011.
- Participated in the Statistical Science Delegation to China on behalf of the American Statistical Association in Dec 2010.
- External reviewer for evaluation of tenure promotion in 2010.
- Chair of the Session XXII – Statistical Inference in Mixed and Multivariate Linear Models III at the LinStat 2010 on July 28, 2010 in Tomar, Portugal.
- Chair of the Session XV at the *MAT-TRIAD 2009* on March 26, 2009, Mathematical Research and Conference Center of the Polish Academy of Sciences in Bedlewo, Poland.
- Chair of the Applied Statistics Session at the 8th Annual Hawaii International Conference on Statistics, Mathematics and Related Fields on January 14, 2009 in Honolulu, Hi.
- Volunteer for two sessions as Session Coordinator for the pre-conference Statistical Tutorials at the SAS Global Forum 2008 conference on March 16, 2008 in San Antonio.
- Volunteer on behalf of San Antonio ASA in support of ARASE Science Fair workshop participants that plan to participate in the 2008 Alamo Regional Science and Engineering Fair at the UT Health Science Center on September 29, 2007 in San Antonio.
- Present the 2007 Don Owen Award to Jeffrey D. Hart, Ph.D., on March 30, 2007 at the Conference of Texas Statisticians in Waco TX.
- Chair of the Cancer Applications, Including Spatial Cluster Detection Session of ASA Biometrics Section at the ENAR Meeting on March 13, 2007 in Atlanta Georgia.
- Chair of the Inference Session of Section on Statistical Computing at the Joint Statistical Meeting on August 7, 2006 in Seattle.
- Volunteer as judge for the San Antonio American Statistical Association (ASA) Chapter Special Award for the best application of statistics at the Exxon Mobil Texas Science and Engineering Fair (EMTSEF) at the Henry B. Gonzalez Convention Center, San Antonio, in 2005, 2006.
- Volunteer as judge for the San Antonio American Statistical Association (ASA) Chapter Special Award for the best application of statistics in the senior division (high school) research projects, at the 2006 Alamo Regional Science and Engineering Fair at the St. Mary's University, San Antonio, on March 11, 2006.
- Present a talk (3 Sessions) at the Career Day on May 6, 2005, at the University of Texas at San Antonio Downtown, San Antonio, TX. The title of my talk was "A Statistician Looks at Diabetic Foot Wounds".

- Organizer of the 2005 Applied Nonlinear Statistical Methods Traveling Course on behalf of the San Antonio Chapter of the American Statistical Association (ASA), and the ASA Council of Chapters, on March 9, 2005.
- Representative of American Statistical Association (ASA), Council of Chapters (COC) (San Antonio) Representative, January 2005- December 2007.
- Editorial Representative/Newsletter Editor to International Indian Statistical Association (IISA), July 2003- June 2004.
- Volunteer for the UT Health Science Center, Science Open House for high school students to publicize the ASA activities at San Antonio, on November 6, 2004.
- Volunteer as judge for the San Antonio American Statistical Association (ASA) Chapter Special Award for the best application of statistics in the senior division (high school) research projects, at the Science and Engineering Fair in the Incarnate Word Grossman International Conference Center, San Antonio, on Mar 8, 2004.
- Volunteer for Career Day Grants exhibition, sponsored by the Committee on Career Development, American Statistical Association, at the Joint Statistical Meetings in San Francisco, on Aug, 2003.
- Volunteer for International Indian Statistical Association (IISA) at the Joint Statistical Meetings in San Francisco, on Aug, 2003.

Academic Service:

- Member, The University of Texas at health Science Center at San Antonio (UTHSCSA) Institutional Review Board, Summer 2011- Present.
- Member, Faculty Senate Academic Policy & Requirements Committee, Fall 2010 – Present.
- Member, Faculty Senate Evaluations, Merit, Rewards, and Workload Committee, Fall 2010 – Present.
- Member, M.S. Program Self-study Committee, Fall 2007—Summer 2008.
- Member, Undergraduate Programs Committee, Fall 2006 – Spring 2008.
- Member, (Substitute for Dr. Ram Tripathi) Committee of Graduate Council, Spring 2006, Spring 2008.
- Member, Graduate Programs Committee, a subcommittee of the Curriculum and Programs Review Committee, Fall 2005 – Spring 2006.
- Member, Search Committee for a faculty position in Statistics in 2006.
- Member, Dean’s Assistant Professor Council, 2005- 06.
- Member, Search Committee for a faculty position in Statistics in 2005.
- Organizer of the departmental Bi-Weekly seminar series, Aug 2004- May 2006.
- Member, Search Committee for two faculty positions in Statistics in 2003.

11. CONSULTING ACTIVITIES:

- Provided Statistical Consulting Service to Department of Kinesiology, the University of Texas at Austin, Austin, TX, 2006-2007.

- Provided Statistical Consulting Service to United States Air Force School of Aerospace Medicine at Brooks AFB, TX, 2002- 2005.
- Statistical consultant for an animal use protocol entitled “Long-acting EPO (Darbepoietin) for protection against laser-induced battlefield injuries to the retina.” Consult provided to US Air Force School of Aerospace Medicine, Hyperbaric Medicine Division, 2004.
- Statistical consultant for an animal use protocol entitled “Evaluation of efficacy of probiotic treatment on infected full-thickness dermal wounds in the pig (*Sus Scrofa*).” Consult provided to US Air Force School of Aerospace Medicine, Hyperbaric Medicine Division, 2004.
- Provided Statistical Consulting Service to Department of Mechanical Engineering and Biomechanics, the University of Texas at San Antonio, TX and to Department of Orthopaedics, University of Texas Health Science Center at San Antonio, San Antonio, TX, 2003- 2009.
- Provided Statistical Consulting Service to Department of Psychology, the University of Texas at San Antonio, TX, March 2004- Sep 2004.

12. REVIEWS/ REFEREES:

Journal Reviews:

- *Journal of the Royal Statistical Society – Series B*
- *Journal of Statistical Planning and Inference*
- *Journal of Multivariate Analysis*
- *Computational Statistics and Data Analysis*
- *Communications in Statistics- Theory and Methods*
- *Communications in Statistics- Simulation and Computation*
- *Metrika*
- *Statistical Methodology*
- *The American Statistician*
- *Journal of Statistical Computation and Simulation*
- *Statistics & Probability Letters*
- *Pattern Recognition Letters*
- *International Journal of Ecological Economics & Statistics*
- *African Journal of Mathematics and Computer Science Research*

Book Reviews:

- Negative Binomial Regression, 2nd Edition, by Joseph M. Hilbe, (Published Online, 2011), *International Review of Economics and Finance*, DOI: 10.1016/j.iref.2011.11.005, 2011.
- Intelligent Decision Support, Handbook of Applications and Advances of the Rough sets Theory, Edited by Roman Slowinski, (1993), Kluwer Academic Publishers, Netherlands, *OPSEARCH Journal*, Vol. 30(4), 368-371.
- Envisioning Information, by Edward R. Tufte, (1993) Graphics Press, Cheshire, Connecticut, U.S.A. *OPSEARCH Journal*, Vol. 30(3), 265-267.

Others:

- *Special Issue of EEST enhanced by the Workshop* held at Middle East Technical University, Turkey.

13. MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:

- American Statistical Association.
- International Indian Statistical Association (Life).
- Honored Member of the Montclair *Who'sWho* among Health Care Professionals.