

NAZARIO D. RAMIREZ-BELTRAN

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PROFESIONAL INTEREST

- Prediction of Drug Stability
- Experimental Design
- Time Series and Regression Analysis
- Estimation of activity coefficients
- Operations Research
- Application of Neural Networks.

EDUCATION

- Ph.D., Industrial Engineering, Texas A&M University 1988
- M.S., Industrial Engineering, Texas A&M University 1983
- B.S., Industrial Engineering, Instituto Tecnológico de Celaya, Celaya, Gto., México 1976
- Quality Control Training Course at Union of Japanese Scientists and Engineers, Tokyo, Japan, October 1979 to May 1980.

MAJOR OUTCOMES

Outcome Total

Book chapters 1

Papers published (referee journals) 15

Papers under review (referee journals) 4

Papers published on conference proceedings 48

Current funded research projects 3

Years having of continuous external funding 15

Projects with external funds as a PI 10

Projects with external funds as a CO-PI 12

EXPERIENCE:

7/97-present. Professor at Department of Industrial Engineering at the University of Puerto Rico. Duty: Teaching graduate and undergraduate courses and conducting funding research. He has conducted research in the following areas: three dimensional estimation of atmospheric variables, rainfall prediction, hurricane tracking prediction, hurricane intensity prediction, water used prediction, neural networks and nonlinear optimization, degradation of pharmaceutical products, monitoring chemical processes, probability distribution for the ratio of two means, inverse prediction for drug products, calibration curves, and integer programming,. He has been supported by the following agencies and companies to conduct research: *National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), National Science Foundation (NSF), U.S. Department of Energy (DOE), U.S. Department of the Interior, Industry University Research Center (INDUNIV), Abbott Diagnostics, Inc., Abbott Chemical Inc., and MOVA Pharmaceutical, Co.* Dr. Ramirez has published several articles in the following journals: *IIE Transactions, Chemical Engineering Communications, Engineering Valuation and Cost Analysis, International*

Journal of Systems Science, Mathematics Today, Journal of the operational research Society, Computers and Industrial Engineering, and Transportation Research Record.

Academic Duty: Dr. Ramirez has 19 years of academic experiences and he has been taught the following courses. **Graduate courses:** (1) ININ-6025 Linear and Discrete Optimization, (2) ININ-6010 Multiple Regression Analysis, (3) ININ-6036 An Introduction to Time Series Analysis, (4) ININ-6005 Experimental Statistics, (5) ININ-5555 An Introduction to Nonlinear Optimization and Neural Networks, (6) ININ-6008 Networks Flows and Graphs in Management Sciences, and (7) ININ-5559 Engineering Statistics. **Undergraduate courses:** (1) ININ-4027 Design and analysis of engineering experiments, (2) ININ-4020 Statistics for engineers, (3) ININ-4010 Probability theory for engineers, (4) ININ-4078 Statistical Quality Control, (5) ININ-4021 Deterministic models in operations research and (6) ININ-4022 Probabilistic Models In Operation Research.

7/91-6/97. Associate Professor at the Department of Industrial Engineering at the University of Puerto Rico. Duty: Teaching graduate and undergraduate courses and conducting funding research.

8/88-6/91 Assistant Professor at the Department of Industrial Engineering at the University of Puerto Rico. Duty: Teaching graduate and undergraduate courses and conducting funding research.

1/88-7/88 Research Assistant at Texas Transportation Institute, College Station, Texas. Duty: develop and implement a statistical sampling procedure to determine the commodity flow in Texas highways.

9/86-12/87 Graduate Research Assistant at Texas A&M University, College Station, Texas. Duty: research on stochastic processes applicable to urban water demand analysis and forecasting. An approach was proposed to aid urban water engineers in forecasting and planning to meet daily water demand. The underlying project was funded by the National Science Foundation.

6/85-8/86 Research Assistant at the Texas Transportation Institute. Duty: propose a methodology for evaluating highway maintenance projects. I was involved in the development of a methodology to assign highway maintenance project to either in-house engineers or private consultant firms.

I also was involved in developing and implementing a computerized procedure for estimating pavement rehabilitation and maintenance expenditures.

9/83-5/85 Teaching Assistant of the Department of Mathematics at Texas A&M University. Duty: teach an introductory course of Calculus, design evaluation tests, and grading papers.

9/76-1/79 Assistant professor and Industrial Project Division Head at the Department of Industrial Engineering of the Instituto Tecnológico de León, Gto., Mexico. Duty: design a shoe manufacturing process and select the appropriate facilities for a factory with a daily production of 1000 pairs of shoes. Courses taught at undergraduate level: linear programming, probability and statistics, statistical quality control, and linear algebra.

REVIEWER OF THE FOLLOWING JOURNALS

Water Resources Research

- Soil and Water Conservation
- Computer & Chemical Engineering
- Geophysical Research Letters

FUNDED RESEARCH PROJECTS (*Related to Bioengineering*)

- 1. "Optimization and Neural Networks to Reduce Lot-End Costs."** Funded by *Abbott Diagnostics Inc., and Industrial Affiliate Program*, January 1, December 31, 1998. **PI: Nazario D. Ramirez-Beltran.** (\$ 21,000)
- 2. "Stability Prediction for Drug Products,"** Funded by *Industry University Research Center(INDUNIV) and MOVA Pharmaceutical Corporation*, August 1997 to July 2000. Grant No. G-97-01, **PI: Nazario D. Ramirez-Beltran.** (\$ 175,000)
- 3. "An On-Line System for Multivariate Process Diagnostics and Monitoring."** Funded by *Industry University Research Center (INDUNIV)*, June 1996 to May 1997. Grant No. G-96-03, Co-PI: Nazario D. Ramirez-Beltran. (\$ 20,000)
- 4. "Neural Networks for On-Line Process Monitoring,"** Funded by *Industry University Research Center (INDUNIV) and Abbott Chemical Inc.*, June 1994 to May 1996. Grant No. G-94-04, **PI: Nazario D. Ramirez-Beltran.** (\$ 50,000)
- 5. "Probability Distribution for the Ratio of two Means."** Funded by *Abbott Diagnostics Inc.*, October 1992 to September 1993. Grant No. G-92-03, **PI: Nazario D. Ramirez-Beltran.** (\$24,000)
- 6. "Inverse Prediction Intervals for Calibration Curves."** Funded by *Abbott Diagnostics Inc.*, June to December 1991. Grant No. G-91-02, **PI: Nazario D. Ramirez-Beltran.** (\$ 24,000)

OTHER FUNDED RESEARCH PROJECTS

- 1. "Collaborative Adaptive Sensing of the Atmosphere: Student Testbed Research Activities."** Funded by the *National Science Foundation (NSF)* with a grant No. 0313747, January 2007 to December 2008. The PI of this project is Dr. Sandra Cruz-Pol, and Nazario D. Ramirez is a Co-PI (\$ 50,000 per year). The total project budget is \$ 3,710,427.
- 2. "Statistical Techniques to Improve the Hydro-Estimator Rainfall Algorithm During Heavy Storms over Puerto Rico."** Funded by *NOAA/NWS* grant NA06NWS4680011. Period September 1, 2006- August 31, 2008. **PI Nazario D. Ramirez.** (\$ 50,000 per year). Total project budget \$ 100,000.
- 3. "Validation and Enhancing satellite precipitation Algorithm."** Funded by *NOAA-CREST* grant NA06OAR4810162. Period August 2007- July 2011. CO-PI Nazario D. Ramirez. (\$ 30,000 per year). Total budget project \$ 300,000 per year.
- 4. "The Climate Impact of the Changing Low Lands on the Caribbean National Forest in the East of Puerto Rico."** Funded by *NASA-IDEAS* grant No. NCC5-595. Period February 2006-January 2007. CO-PI Nazario D. Ramirez. Total budget project \$ 30,000.

5. **“Soil Moisture Estimation and Validation a Hydro-Estimator.”** Funded by NOAA-CREST grant NA17AE1625. Period August 2003- July 2006. CO-PI Nazario D. Ramirez. (\$ 90,000 per year). Total budget project \$ 300,000 per year.
6. **“Climate Change Detection and Hurricane Tracking and Intensity.”** Funded by NASAEPSCoR grant NCC5-595. Period August 2001- July 2006. CO-PI Nazario D. Ramirez. (\$70,000 per year). Total budget project \$ 500,000 per year.
7. **“Seasonal to Century Scale Climate Effects on the Water Resources of the U.S. Virgin Islands.”** Funded by the *U.S. Geological Survey*. August 2002 to July 2003. CO-PI: Nazario D. Ramirez. (\$60,000).
8. **“Monitoring the Water Quality Parameters of Mayaguez Bay.”** Funded by *Environmental Protection Agency (EPA)*. August 2001 to July 2004. Grant CIMP-001. **PI: Nazario D. Ramirez** (\$ 120,000).
9. **“Radiosonde and Satellite Imagery Correlation.”** Funded by *National Aeronautics and Space Administration (NASA)*. March 2000 to February 2001. **PI: Nazario D Ramirez** (\$30,000).
10. **“Caribbean Atmospheric Dynamics.”** Funded by *National Aeronautics and Space Administration (NASA)*. This project is a part of the *Tropical Atmospheric Research Center*, August 1999, to July 2001. Co-PI. (\$ 100,000)
11. **“Development of Weight Probability Distributions and Truck Factors for Puerto Rico.”** Funded by *University Transportation Research Center, New York*, October 1, 1996 to September 30, 1997, Co-PI Nazario D. Ramirez-Beltran. (\$ 20,000)
12. **“Performance and Survivor Curves for Flexible Pavements in Puerto Rico,”** Funded by *National Science Foundation (NSF)*, August 1995 to July 1997, Co-PI: Nazario D. Ramirez- Beltran. (\$ 30,000)
13. **“Tracking and Forecasting of Synoptic Scale Weather Events and Hurricanes”**, Funded by *National Science Foundation (NSF)*, October 1993 to October 1995. Grant No. HDR-9353549, Co-PI: Nazario D. Ramirez-Beltran. (\$ 30,000)
14. **“Time Series Models and Neural Networks to Control and Forecast the Surface Water Pollution in Puerto Rico,”** Funded by *U.S. Department of the Interior*, June 1994 to May 1995. Grant No. G-2043-05, **PI: Nazario D. Ramirez-Beltran.** (\$ 20,000)
15. **“Prediction of Water Use in Puerto Rico (Phase I: Mayaguez).”** Funded by *the U.S. Department of the Interior*, June 1992 to May 1993. Grant No. 14-08-0001-G-2043, **PI: Nazario D. Ramirez-Beltran.** (\$ 25,000)
16. **“Hurricane Tracking Prediction.”** Funded by the *National Science Foundation (NSF)*, June 1991 to August 1993. Grant No. REI-8802961, Co-PI: Nazario D. Ramirez-Beltran. (\$ 30,000) **BOOK CHAPTER (Related to Bioengineering)**
 [1] Ramirez-Beltran, N. D., Rodriguez, H., and Estevez, L. A. *Pharmaceutical Manufacturing Handbook*, Chapter: **Drug Stability**. Edited by Shayne C. Gad. In press and will be published on 2008 by John Wiley & Sons.

PAPER UNDER REVIEW (Related to Bioengineering)

[1] Ramirez-Beltran, N.D. Rodriguez, H., Estevez, L. A. and Duarte, H. **A Neural Network Approach to Predict Activity Coefficients**. Submitted on January, 2007 to *Computers & Chemical Engineering Journal*.

OTHER PAPERS UNDER REVIEW

[1] Ramírez-Beltran, N.D, Vasquez, R. Harmsen, E. Cruzado, H., and Castro, J.

Transfer function models and neural networks to estimate soil moisture.

Submitted on October, 2006 to *Journal of the American Water Resources Association*.

[2] Ramírez-Beltran, N.D, Calderon, C. Vasquez, R. Harmsen, E. and Castro, J.M.

Remote sensing and statistical techniques to estimate soil moisture over tropical areas. Submitted on September, 2007 to *Journal of Applied Remote Sensing*.

[3] Ramirez-Beltran, N.D., Castro, J.M., Gonzalez, J., Erickson, D. J., Jury, M., and Allison, J., **Long-term prediction of named storms in the North Atlantic Basin.**

Submitted on June 2007 to *International Journal of Climatology*.

PUBLICATIONS IN JOURNALS OR IN PROCEEDINGS (*Related to Bioengineering*)

Journal papers are given in blue color.

1. Ramirez-Beltran, N.D. Rodriguez, H., and Estevez, L. A. **Use of Neural Networks to Estimate Activity Coefficients.** *Congreso de Computacion Aplicada CAIP' 2007*.

2. Ramirez-Beltran, N.D. Rodriguez, H., and Estevez, L. A. A Neural Network Approach to Estimate Activity Coefficients in Binary Systems. Asociacion Argentina de Ingenieros Industriales. *IACChE-International Confederation of Chemical Engineering*, 2006

3. Ramirez-Beltran, N.D. and F. Chong. **Multivariate Process Control Using Neural Network.** *Proceedings of the Fourth Asia-Pacific Conference on Industrial Engineering and Management Systems*, Taipei, Taiwan, Dec. 18-20, 2002.

4. Ramirez-Beltran, N.D. and Montes, J.A., **Neural Networks to Model Dynamic Systems with Time Delays.** *IIE Transactions*, Vol. 34, 313-327, 2002.

5. Srihar, L.N., Ramirez-Beltran, N.D. and Rodriguez, H., **Thermodynamic Stability of Solid Pharmaceutical Formulations.** *Chemical Engineering Communications*, Vol. 185 59-66, 2001.

6. Ramirez-Beltran, N.D., and Colucci, B., **Aplicación de la Distribución Weibull para Estimarla Vida Remanente de Pavimentos Flexibles.** *Revista Internacional de Desastres Naturales, Accidentes e Infraestructura Civil*, Vol. 1, 41-50, 2001.

7. Ramirez-Beltran, N.D., and Rodriguez, H., **A Neural Network Approach to Estimate the Chemical Activity Coefficients.** *Proceedings of Group Technology and Cellular Manufacturing*, 349-354, 2000.

8. Ramirez-Beltran, N.D., **Neural Networks and Accelerated Tests to Predict Shelf Life of Drug Products.** *Proceedings of Group Technology and Cellular Manufacturing*, 355-360, 2000.

9. Ramirez-Beltran, N.D. and H. Jackson, **Application of Neural Networks to Chemical Process Control",** *Computer & Industrial Engineering*, Vol. 37., No. 1-2, 387-390, 1999.

10. Ramirez-Beltran, N.D. and L. Olivares, **Statistical Analysis of Drug Stability.** *Computer & Industrial Engineering*, Vol. 37, No. 1-2, 351-354, 1999.

11. Ramírez-Beltran, N.D., **Neural Networks to Minimize Lot-End Costs.** *Proceedings of the 3th International Conference on Engineering Design and Automation*, Vancouver, Canada, 352- 358, 1999.

12. Ramirez-Beltran, N.D., L. Sridhar, and H. Rodriguez, **A Nonlinear Model to Estimate Chemical Interaction Coefficients.** *Proceedings Computing Research Conference CRC'98*, 54-57, 1998.

OTHER PUBLICATIONS IN JOURNALS OR IN PROCEEDINGS. (Journal papers are given in blue color)

1. Ramirez-Beltran, N.D., Cruz-Pol, S., Ortiz, X., Castro, J.M., Kuliwoski, R. An algorithm to improve the NEXRAD rain rate estimates. *IEEE International Geosciences and Remote Sensing Symposium*, Barcelona, Spain, 23-27, July, 2007.
2. Ramirez-Beltran, W.K.M. Lau, A. Winter, J.M. Castro, and N.R. Escalante. **Empirical Probability Models to Predict Precipitation Levels over Puerto Rico Stations.** *Monthly Weather Review*. Vol. 135, No. 3, pp 877-890, 2007.
3. Ramirez-Beltran, N.D. Julca, O., and Gonzalez, J. Detection of Global and Caribbean climate changes. *19th Conference on Climate Variability and Change, at the 87th American Meteorological Society Annual Meeting*, San Antonio TX, January 14-19, 2007.
4. Ramirez-Beltran, N.D., Calderon, C. and Vazques R. An empirical model to estimate soil moisture over vegetated areas. *21th Conference on Hydrology, at the 87th American Meteorological Society Annual Meeting*. San Antonio TX, January 14-19, 2007.
5. Ramirez-Beltran, N.D., Calderon, C. Vasquez, R. **Vertical Soil Moisture Profile Based on *In-Situ* and Satellite Observations.** *The NOAA/EPP Fourth Education and Science Forum*, Tallahassee, FL, October 30-November 1, 2006.
6. Ramirez-Beltran, N.D. Castro, J.M. Gonzalez, J. and Angeles, M. **Prediction of trends of tropical Storms in the North Atlantic.** *27th Conference on Hurricanes and Tropical Meteorology*, Monterrey, CA, April, 24-28, 2006.
7. Ramirez-Beltran, N.D. and Julca, O. **Detection of a Local Climate Change,** *The 18th Conference on Climate Variability and Change, at the 86th American Meteorological Society Annual Meeting*, Atlanta Georgia January 28 to February 3, 2006.
8. Ramirez-Beltran, N.D., R. Vasquez, H. Cruzado and E. Harmsen. **A Short- and Long-Term Memory Model to Estimate Soil Moisture.** *The 31th International Symposium on Remote Sensing of Environment – 2005 “Global Monitoring for Sustainability and Security.”* Saint Petersburg Russia. June 20-24, 2005,
9. Ramirez-Beltran, N.D., Gilbes, F., and Castro, J.M. **Empirical Models to Estimate Seawater Parameters in Mayagüez Bay.** *The 31th International Symposium on Remote Sensing of Environment – 2005 “Global Monitoring for Sustainability and Security.”* , Saint Petersburg Russia. June 20-24, 2005.
10. Ramirez-Beltran, N.D., R. Vasquez, H. Cruzado, and E. Harmsen. **A Transfer Function Model to Estimate Soil Moisture.** *Proceedings of Research & Education Advancements in Oceanic & Atmospheric Sciences*. New York, October 21-23, 2004, pp 175-180.
11. Ramirez-Beltran, N.D., F. Gilbes, and J.M. Castro. **A stochastic-dynamic model to predict fecal coliforms at the mouth of the Añasco River.** *Coastal Environment V Incorporating Oil Spill Studies*, WIT Press, Great Britain, pp 83-93, 2004. (Note: peer review paper published in a book).
12. Ramirez-Beltran, N.D., and A. Veneros. **Upper Air Information and Neural Networks to Estimate Hurricane Intensity.** Preprints of the American Meteorological Society: *The 26th*

- Conference on Hurricanes and Tropical Meteorology*. Miami FL, May 2-7, 2004
13. Ramirez-Beltran, N.D., and J.M. Castro, **Deep Layer of Upper Air and Multivariate Time Series Models to Predict Hurricane Tracks**. Preprints of the AMS: *The 26th Conference on Hurricanes and Tropical Meteorology* Miami FL, May 2-7, 2004.
14. Ramirez-Beltran, N.D. W.K.M. Lau, A. Winter, A. Veneros. **An Algorithm for Variable Selection with an Application to Meteorological Teleconnections**. Preprints of the AMS: *The 17 Conference on Probability and Statistics in the Atmospheric Sciences. 84th Annual AMS Meeting: Seattle WA* January 10 -15, 2004.
15. Ramirez-Beltran, N.D., F. Chong, A. Winter, A. Veneros, and N. R. Escalante. **Neural Networks Estimate Atmospheric Variables in the Caribbean**. *The Third Conference on Artificial Intelligence Applications to the Environmental Science: 83th Annual AMS Meeting*. Long Beach California, February 9-13, 2003.
16. Ramirez-Beltran, W.K.M. Lau, A. Winter, J.M. Castro, and N.R. Escalante. **Empirical Probability Models to Predict Puerto Rico Monthly Rainfall Process**. *17th Conference on Hydrology, 83th Annual AMS Meeting*. Long Beach California, February 9-13, 2003
17. Ramirez-Beltran, N.D., **Application of Mixed Integer Programming to Cellular Manufacturing**, *Engineering Valuation and Cost Analysis*, Vol 2., 373-386, 2000.
18. Ramirez-Beltran, N.D., B. Colucci, and J. Vega, **Prediction of Traffic Load Using Weigh-in- Motion Data**. *Proceedings of 10th Congress of Pan American of Engineering Traffic and Transport*, Santander Spain, September 21-24, 1998.
19. Ramirez-Beltran, N.D., **An Algorithm for Pure Integer Programming**. *Proceedings of 29th Annual Meeting of the Decision Science Institute*, pp 1065-1067, Las Vegas, Nevada,
20. Ramirez-Beltran, N.D., **Neural Networks to Detect Trends and Correlations in Time Series**. *Proceedings of 2nd International Conference on Engineering Design and Automation*, in press, Maui, Hawaii, August 9-12, 1998.
21. Ramirez-Beltran, N.D., and N. Quiñones, **A Nonlinear Formulation for the Balancing Problem**. *Proceeding Computing Research Conference CRC'98*, 41-43, 1998.
22. Ramirez-Beltran, N.D., R. O. Colon, **Experimental Design to Optimize a Manufacturing Process**. *Proceeding Computing Research Conference CRC'98*, 48-50, 1998
23. Ramirez-Beltran, N.D., and L. Olivares. **Drug Shelf-life Estimation Using Clustering Techniques**. *Proceeding Computing Research Conference CRC'98*, 70-73, 1998
24. Ramirez-Beltran, N.D., and T. Sastri. **Transient Detection with an Application to a Chemical Process**. *Computers & Industrial Engineering*, Vol. 32, No. 4, pp 891-908, 1997.
25. Colucci, B., N.D. Ramirez-Beltran, and F. Rodriguez. **A Methodology for Developing Generic Performance Curves for Flexible Pavements in Puerto Rico Using Clustering Techniques**. *Transportation Research Record*, No. 1592, pp 116-124, 1997.
26. Colucci, B., Ramirez-Beltran, N.D., and F. Dosal. **Performance and Survivor Curves to Estimate Remaining Life for Flexible Pavements**. *Dimension*, Year II, Vol. 3, pp 116-124, 1997.

27. Colucci, B., Ramirez-Beltran, N.D., and J. Velar. **Analysis and Evaluation of Physical Characteristics of Hot Asphalt Mixtures Using Crumb Rubber as a Modifier.** *Proceedings VIII Congreso Chileno de Ingenieria y Transporte*, 1997.
28. Ramirez-Beltran, N.D. **Transfer Function Models to Control a Chemical Process.** *Proceedings of the 21th International Conference on Computers & Industrial Engineering*, pp 417-420, San Juan, Puerto Rico, March 9-12, 1997.
29. Ramirez-Beltran, N.D. and J. Montes. **Neural Networks for On-Line Parameter Change Detection in Time Series Models.** *Proceedings of the 21th International Conference on Computers & Industrial Engineering*, pp 337-340, San Juan, Puerto Rico, March 9-12, 1997.
30. Ramirez-Beltran, N.D. and K. Ruggiero. **Application of a Heuristic Procedure to Solve Mixed Integer Programming Problems.** *Proceedings of the 21th International Conference on Computers & Industrial Engineering*, 43-46, San Juan, Puerto Rico, March 9-12, 1997.
31. Ramirez-Beltran, N.D. **A Vector Autoregressive Model to Predict Hurricane Tracks.** *International Journal of Systems Science*, Vol. 27, No. 1, pp 1-10, 1996.
32. Ramirez-Beltran, N.D., and R. Patxot,. **Neural networks with a Geometric Kernel to Control a Chemical Process.** *Proceedings of the 20th International Conference on Computers & Industrial Engineering*, pp 661-664, Pusan, Korea, October 6-9, 1996.
33. Ramirez-Beltran, N.D. **The Ratio Control Chart.** *Proceedings of the 1996 Annual Meeting of the Decision Sciences Institute*, Orlando, Florida, November 24-26, 1996.
34. Colucci, B., N.D. Ramirez-Beltran, and A. Medina. **Estimation of Truck Factors for Flexible Pavements in Puerto Rico.** *Proceedings of the 9th Pan American Congress of Traffic and Transportation Engineering*, La Havana, Cuba, December 2-6, 1996.
35. Ramirez-Beltran, N.D., B. Colucci, and K. Aguilar. **Simulation Techniques to Divide the Gross Vehicle Weight into Axle Loads.** *Computing Research Conference CRC'96*, pp 1-2, Mayaguez, Puerto Rico, April 18, 1996.
36. Ramirez-Beltran, N.D., and M. Vargas, **An On-Line Transfer Function to Control a Chemical Process.** *Computing Research Conference CRC'96*, pp 84-85, Mayaguez, Puerto Rico, April 18, 1996.
37. Ramirez-Beltran, N.D., **Integer Programming to Minimize Labor Costs.** *Journal of the Operational Research Society*, Vol. 46, No. 2, pp 139-146, 1995.
38. Ramirez-Beltran, N.D. **Autoregressive and Adaptive Estimation with an Application to Hurricane Track Prediction.** *International Journal of Systems Science*, Vol. 26, No. 10, pp 1791-1812, 1995.
39. Ramirez-Beltran, N.D., **Pattern Recognition for Parameter Change Detection in ARIMA Models.** *Proceedings of Neural, Parallel and Scientific Computations*, Vol. 1, pp 391-394, 1995.
40. Ramirez-Beltran, N.D. **A Statistical Model to Predict Hurricane Tracks.** *The 21th Conference on Hurricanes and Tropical Meteorology*, pp 488-490, Miami, Florida, April 24-28, 1995.
41. Ramirez-Beltran, N.D. **A Step Parameter Change in an ARIMA(1,1) Model.** *Third International Conference on Stochastic Structural Dynamics*, pp 7.100-7.106, San Juan, Puerto Rico, January 15-18, 1995.

42. Ramirez-Beltran, N.D., and Lopez, Miguel A., **Identification of Autoregressive Moving Average Models Using Neural Networks.** pp 37-38, *Computing Research Conference CRC'95*, April 28, 1995.
43. Ramirez-Beltran, N.D. **Integer Programming with Stochastic Coefficients.** *Mathematics Today*, Vol XII-A, pp 35-50, 1994.
44. Ramirez-Beltran, N.D. **Optimal Neural Network Architecture.** *Proceedings of the 1994 Symposium on Intelligent Systems and Power*, pp 106-113, Mayaguez, Puerto Rico, February 21-23, 1994.
45. Ramirez-Beltran, N.D. and Llaugel, F. **The Ratio Control Chart and Pattern Recognition.** *48th Annual Quality Congress Proceedings*, pp 583-590, Las Vegas, Nevada, May 24-26, 1994.
46. Colucci, B., J.L. Perez, and Ramirez-Beltran, N.D. **Un Nuevo Enfoque para el Análisis de Datos de Medición de Rugosidad para un Sistema de Gerencia de Pavimentos.** *The 8th the Pan American Congress of Traffic and Transportation Engineering*, México City, julio 1994.
47. Ramirez-Beltran, N.D. **The Control Limits for the Ratio Control Chart.** *1994 Annual Meeting of the Decision Science Institute*, pp 2115-2117, Honolulu Hawaii, November 20-22, 1994.
48. Ramirez-Beltran, N.D., **A Monthly Prediction Model for Industrial Water Use.** *1993 Conference on Advances in Water Resources Research in Puerto Rico and USA Virgin Islands*, pp 27-28, San Juan Puerto Rico, October 1, 1993.
49. Ramirez-Beltran, N.D., M. Jimenez and J.T. Allison. **Optimization of Electrical Energy Distribution for a Deficient System.** *Journal of the Operational Research Society*, Vol. 44, No. 8, pp 761-772, 1993.
50. Ramirez-Beltran, N.D. **Optimal Estimation for Piecewise Regression Models.** *ASQC TRANSACTIONS*, pp 458-464, May, 1992.

PROFESSIONAL CONSULTING WORK

1. **“Neural Networks to Minimize Scrap.”** Consulting work conducted at Abbott Diagnostics Inc., October to December 1997. A computer program was designed to minimize the scrap in a pharmaceutical production line.
2. **“Application of Neural Networks to Chemical Process Control.”** Consulting work was conducted at Abbott Chemical Inc. A computer program was developed to control the pH of erythromycin acetate salt in a continuous extraction process, October 1994 to September 1996.
3. **“A Computer Program to Perform the Ratio Test.”** A computer program was developed to test the parameters involve in the ratio of two normally dependent statistics. This consulting work was developed at the Abbott Diagnostics Inc., January to December 1993.

AWARDS

1. Distinguished Professor of the Industrial Engineering Department University of Puerto Rico 2005
2. A NASA Summer Faculty Fellowship at the Goddard Space Flight Center, (summer 2001).
3. EPSCoR Scholarly Productivity Award 1999.
4. EPSCoR Scholarly Productivity Award 1997.
5. EPSCoR Scholarly Productivity Award 1996.

6. Academy Excellent Productivity award 1995.
7. Distinguished Professor of the Industrial Engineering Department University of Puerto Rico 1995
8. Scholarship from CONACYT (a Mexican Agency) to take a training course in Japan
9. Scholarship from CONACYT (a Mexican Agency) to study Master Degree at Texas A&M

CURRENT MASTER STUDENTS UNDER SUPERVISION

1. Joan Manuel Castro. Downscaling Techniques for the General Circulation Model. Expected graduation date December 2007. (Supported with the NOAA project)
2. Shirley Milena Clavijo Mosquera. Dynamic Scheduling of Stems on the Spry Coating Process. Expected graduation date May 2008.

SUPERVISED GRADUATE STUDENTS

1. Oswaldo Julca (2007) Thesis: **Detection of Climate Change over the Global and Caribbean Basin.**
2. Christian Calderon (2007) Thesis: **Redes Neuronales Artificiales y Funciones de Transferencia Aplicados a la Estimacion de Humedad de Suelo y Temperatura del Aire.**
3. Harry Rodriguez (2006) Thesis: **A Neural Network Method to Predict Activity Coefficients for Binary Systems Based on Molecular Functional Group Contribution.**
4. Walter Quispe (2006) Thesis: **Bootstrap in Autocorrelated Processes with an Application to Meteorology.**
5. Anthony Veneros. (2004) Thesis: **A Neural Network Approach to Predict Hurricane Intensity in the North Atlantic Basin.**
6. Luis Olivares, (1999) Thesis: **“Statistical Estimation of Drug Shelf Life.”**
7. Jaime Montes, (1999) Thesis: **“Adaptive Control and Time Delay Detection with Neural Networks and Optimization.”**
8. Karina A. Ruggiero, (1997) thesis: **“Development of a Heuristic Algorithm to Solve Mixed- Integer Programming Problems.”**
9. Rosanna G. Paxot, (1996), thesis: **“A Process Control by Means of Neural Networks with a Geometric Kernel.”**
10. Felipe Llaugel, (1993), thesis: **“Process Control of the Ratio Chart of Two Sample Means Using Pattern Recognition and Neural Networks.”**
11. Mike F. Acuña, (1993), thesis: **“Statistical Models to Predict the Water Use in Mayaguez, Puerto Rico.”**
12. Olga M. Gomez, (1992), thesis: **“Development and Analysis of Calibration Curves.”**

AFFILIATIONS

American Meteorological Society
American Statistical Association
INFORMS

DISSERTATION TITLE

Nonlinear Intervention Modeling with an Application to Time Series Forecasting.

CHAIRMAN OF ADVISORY COMMITTEE

Dr. Tep Sastri

SOCIAL CONTRIBUTION

- Dr. Ramirez-Beltran funded the "Mayaguez Soccer Club" on February 1989. This club was composed by 60 members. He was the Head of the Director Board of this Club during four years.
- Dr. Ramirez-Beltran funded the "Asociación de Balompié del Suroeste de Puerto Rico," on March 1990. This association included the following towns: Mayaguez, Cabo Rojo, Añasco, Aguada, Aguadilla, San German, Hormigueros y Lajas. He was the President of this association during the period from March 1990 to May 1993.

SELECTED TECHNICAL REPORTS

1. Ramirez-Beltran, N.D., "**Optimization and Neural Networks to Reduce Lot-End Costs,**" Final Report, *Abbott Diagnostics Inc.*, Barceloneta Puerto Rico, January, 1999.
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