

# **CARLOS MIGUEL FERREGUT**

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**RESEARCH INTERESTS:** Structural Reliability, Structural Damage Assessment, Risk Analysis, Expert Systems, Neural Networks, Lattice Domes

## **I. EDUCATIONAL BACKGROUND**

Ph.D.	1986	Civil Engineering – Structures, University of Waterloo, Canada
M.S.	1981	Structural Engineering, National Autonomous University of Mexico
B.S.C.E	1979	Civil Engineering, National Polytechnic Institute, Mexico

## **II. EMPLOYMENT HISTORY**

- Associate Dean of Engineering for Academic Affairs and Undergraduate Studies, UTEP, September 2007 – to date.
- Associate Dean of Engineering for Undergraduate Studies, UTEP, September 2006 – August 2007
- Director of Civil, Industrial, Mechanical and Metallurgical and Materials Engineering Division, UTEP, November 2004 – August 2006
  - Chair of Civil Engineering, University of Texas at El Paso, September 1998- November 2004
- Associate Director, FAST Center for Structural Integrity of Aerospace Systems, UTEP, Oct 1995-Sep. 1998.
- Professor of Civil Engineering, UTEP, September 1999-present
- Associate Professor of Civil Engineering, UTEP, September 1994-August 1999
- Assistant Professor of Civil Engineering, UTEP, January 1990- August 1994
- Senior Engineer, Fleet Technology Limited, Nepean, Ontario, January 1986-December 1989.
- Research Assistant, Department of Civil Engineering, University of Waterloo, September 1981- December 1985
- Technical Advisor, Ministry of Agriculture and Water Resources, Mexico City, January 1980 August 1981
- Research Assistant, Institute of Engineering, National Autonomous University of Mexico, September 1979-December 1980
- Structural Engineer, Sistemas y Procesos para Ingeniería S.A., Mexico City, November 1978 August 1979

## **III. OTHER APPOINTMENTS**

- Visiting Scientist, US Air Force Wright-Patterson Research Lab, June 1998- August 1998

- Director, Geometrica Inc., Houston, Texas, August 1992 – present
- Visiting Professor, Autonomous University of Chihuahua, Jan 1992-Dec 1992

#### **IV. PROFESSIONAL MEMBERSHIP**

American Society of Civil Engineers

- Committee on Fatigue and Fracture Reliability
- Faculty Advisor of UTEP's student chapter
- Special Structures Committee
- El Paso Branch Continuing Education Committee
- EL Paso Branch Director (1993-2002)

American Society of Engineering Education

International Association for Civil Engineering Reliability and Risk Analysis

Colegio de Ingenieros Civiles de México

Canadian Society for Civil Engineering

Structural Engineering Association of Texas

#### **V. PUBLICATIONS**

##### **Journals, Conferences and Book Chapters**

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Nazarian, S., Abdallah, I., Melchor, O. and Ferregut C., "A probabilistic method for estimating Pavement Performance Using Falling Weight Deflectometer," *6<sup>th</sup> International Conference on Bearing Capacity of Roads, Railways and Air fields*, Lisbon, Portugal, 2002.

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Osegueda, R.A., Macias, M., Andre, G., Ferregut, C. and Carrasco, C., "Fusion of Modal Strain Energy for Health Monitoring of Aircraft Structures," *SPIE Smart Structures and Materials*, Newport Beach, CA, March 5-9, 2000.

Osegueda, R.A., Lopez, H., Pereyra, L., Ferregut, C.M., "Localization of Damage Using Fusion of Modal Strain Energy Differences," *Proc. of International Modal Analysis Conference XVIII, SEM, Vol. I*, San Antonio, TX, Feb. 7-10, 2000, pp. 695-701.

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Paez, T., Barney P., Hunter, N., Ferregut, C. and Perez, L.E., " Statistical Validation of Physical Systems Models, 67th Shock and Vibration Symposium, Monterrey, California, November 18-22, 1996 .

Ferregut, C., Osegueda, R.A., Gutierrez, J., and Ortiz, J. "Detección y Clasificación de Danos Estructurales Usando Redes Neuronales Artificiales," Memorias del X Congreso Nacional de Ingeniería Estructural, Mérida, Yucatán, November 16-19, 1996, pp. 268-276.

Warke, W.R., Ferregut, C., Glover A.G. and Horsley D.J., " Structural Reliability Concepts in Fitness-for-Service with Application to Girth Weld Plastic Collapse," Proceedings of The Ninth Symposium on Line Pipe Research, Houston, Texas, September 30-October 2, 1996, pp. 39-1 - 39-24.

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Melchor-Lucero, O. and Ferregut, C., "Toward an Expert System for Damage Assessment of Structural Concrete Elements," Artificial Intelligence for Engineering Design Analysis and Manufacturing Journal, Vol. 9, 1995, pp.401-418.

Ferregut, C., Osegueda, R.A. and Ortiz,J., "Artificial Neural Networks for Structural Damage Detection and Classification," in Smart Structures and Materials: Smart Systems for Bridges, Structures and Highways, L.K. Matthews (Ed.), Proc. SPIE 2446, 1995, pp.68-80.

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Melchor-Lucero, O. and Ferregut, C., "Sistemas Expertos para Ingeniería Civil," Edifica, No. 42, January 1994, pp.10-18.

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### **Abstracts**

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Ferregut, C., Abdallah, I., Melchor-Lucero, O. and Nazarian, S. "Artificial Neural Networks-Based Methodologies for Rational Assessment of Remaining Life of Existing Pavements, Report TX-99 1711-1, Submitted to Texas Department of Transportation April 1999.

Ferregut, C., Carrasco, C., "Strength Characterization of Geometrica Connector Type 6ZD-00," Report Submitted to Geometrica, Inc., December 1998.

Carrasco, C.J and Ferregut, C. "Nonlinear Finite Element Analysis of Geometrica Connector Series 6-6090, Report Submitted to Geometrica, Inc., February 1998.

Warke, R. and Ferregut, C. "Reliability-Base Fitness-for-Service Assessment of Pipeline Girth Welds," Final Report, EWI Project No. J7281, December 1997.

Carrasco C.J., Osegueda R.A., Ferregut, C.M. "Modal Tests of a Space Truss Model and Damage Localization Using Modal Strain Energy" Report FAST 96-1, FAST Center for Structural Integrity of Aerospace Systems, UTEP, July 1996.

Warke, R. and Ferregut, C. "Reliability-Based Fitness-for-Service Assessment of Pipeline Girth Welds, Phase 1: Plastic Collapse" EWI Project No.J7281, March 1996.

Ferregut, C., Osegueda, R., Stephenson, T. and Ortiz, J. "Reliability of Damaged Space Structures from Vibrational Measurements," research report for Grant No. NAG 9-483, submitted to NASA, Johnson Space Center, February, 1992.

Ferregut, C. "Probabilistic Based Ship Design Procedures - A Demonstration," UTEP-URI Final Project Report, October, 1991.

Murray, A., and Ferregut,C. "Reliability Methods for Ship Structures," DREA Report No. CR/90/441, Halifax, Nova Scotia, 1990.

Murray, A., Ferregut, C., and Ritch, R., "Analysis of Sub scour Stresses and Probability of the Scour Induced Damage for Buried Submarine Pipelines," PERD, Canadian Oil and Gas Land Administration, March, 1990, 0825-25-6-4.

Ferregut, C., Jutla, C. and Graville, B., "Probabilistic Modeling for Local Brittle Zones in the Heat Affected Zones of Welded Structures," Fleet Technology Report FTL E73330, 1990.

Comfort, G., Gilbert, G. and Ferregut, C., "Data Base for Analysis of Probability of Damage Due to Ice Scour for Two Pipeline Routes," Volumes I and II, Fleet Technology Report FTL 32351, March, 1989.

Ferregut, C. and Daley, C., "Towards an Understanding of Stiffener Tripping Under External Lateral Loading," Transport Canada Report 9712E, January, 1989.

Ferregut, C. and Daley, C., "ASPEN Structural Modeling Using Limit States," Fleet Technology Report FTL 3061, August, 1988.

Comfort, G., Abdelnour, R., Ferregut, C. and Murray, A., "Preliminary Review of Bercha (1988) Ice Jamming Model And Assessment of Proposed Designs for PEI Crossing," Fleet Technology Report FTL 3134c, July, 1988.

Daley, C., and Ferregut, C., "Strength and Stability of Framing for Ice Strengthening," Transport Canada Report TP9157E, March, 1988.

Daley, C.G., Perchanok, M., Ferregut, C., and Brown, R. "Arctic Shipping Probability Evaluation Network - Model Update to March 1987," Vols. I and II, Transport Canada Report No. TP8554E, March, 1987.

Daley, C. and Ferregut C., "Structural Requirements for Submarines in Brash Ice," Arctec Canada Report 1959D, November, 1986.

Perchanok, M. and Ferregut, C., "Feasibility of Under Ice Operations for a Conventional Submarine", Arctec Canada Report 1959B, October, 1986.

Esteva L., Ferregut C., Chavez M. and Tellez F., "Structural Design Criteria for Offshore Structures," Institute of Engineering, National Autonomous University of Mexico, 1981.

### **Editorships**

Proceedings of the Workshop on Intelligent NDE Sciences for Aging and Futuristic Aircraft, C. Ferregut, R. Osegueda and A. Nunez (Eds.), El Paso, Texas, Sep 30-Oct 2, 1997.

### **VI. CONTRACTS AND GRANTS**

"North American Engineering Innovation and Training Project: Enhancing the future of engineering through collaboration," U.S. Department of Education, 9/07-8/11, \$87,500, PI with H. Nazeran and A. Nunez

"Integration of Non-destructive Testing Data Analysis Techniques," TXDOT, 9/03-8/05, \$260,000, Co-PI with S. Nazarian and Imad Abdalah.

“Development of a Construction Management Course,” 3D/I Inc., 8/03 – 12/03, \$35, 000, PI with Vivek Tandon,

“LAMB Wave Scanning and Intelligent NDE for Wide Area Aircraft Inspections,” US AFOSR, 9/00 – 8/03, \$300,000 Co-PI with R. Osegueda and S. Nazarian.

“ Impact of Construction Quality on Life-Cycle Performance of Pavements Using Mechanistic Analysis,” TXDOT, 9/00 – 8/03, \$212,000, Co-PI with S. Nazarian and I. Abdallah.

“Data Fusion Methodologies for Damage Monitoring of Aerospace Structures,” NASA Johnson Space Center, 5/99 – 4/2003, \$162,000, PI. with R. Osegueda.

“Data Fusion Methodologies for Intelligent Nondestructive Evaluation,” US Air Force Research Laboratories, 6/99 – 5/02, \$192,000, PI. with R. Osegueda and S. Nazarian.

“Workshop on Intelligent Nondestructive Evaluation Sciences for Aging and Futuristic Aircraft,” AFOSR 5/97 – 9/97, \$29,904, PI. with R. Osegueda.

"Development of a Comprehensive Rational Method for Determination of Remaining Life of an Existing Pavement, TXDOT, 9/96 8/99, \$219,000, PI with S. Nazarian and I. Abdallah.

"Development of Analytical Tools to Process Modal Analysis Data for Damage Monitoring of Structures," NASA Johnson Space Center, 9/96 – 8/99, \$163, 746, PI with R. Osegueda.

"FAST Center for Structural Integrity of Aerospace Systems,” AFOSR, 10/95 – 9/01, \$3 325 000, Co-PI with R. Osegueda, S. Nazarian, L. Murr and J. Pierluisi.

"Reliability-Based Fitness-For-Service Assessment of Pipeline Girth Welds, American Gas Association, (Subcontractor to Edison Welding Institute), 3/94 – 3/97, \$50,000, PI.

"Development of a Damage Assessment Methodology for Space Structures Using Neural Networks," NASA, 9/93 – 8/95, \$44,000, PI.

"U.T. El Paso Transportation Technology Transfer Subcenter - Continuation Agreement,” Texas Engineering Extension Service, The Texas A&M University System, 9/92 – 8/93, \$53,400, Co – PI with R. Osegueda.

“Determination of Unknown Subsurface Bridge Foundations,” National Cooperative Highway Research Program, NCHRP Project 21-5, (Subcontractor to Olson Engineering, Inc.), 9/92 – 12/93, \$10,500. Co-PI with S. Nazarian and M. Baker.

“Development of an Expert System for the Design of Drilled Shafts in Expansive Soils,” Texas Higher Education Coordinating Board, 1/91 – 8/94, \$120, 000, PI with M. Picornell.

"Reliability of Damaged Space Structures from Vibration Measurements," NASA Johnson Space Center, 9/90 – 12/95, \$238,575, PI with R. Osegueda.

"Evaluation of Bridge Stresses Under Unusual Vehicle Widths and Axle Configuration," Texas Department of Transport, 9/90 – 8/92, \$40,000, Co-PI with R. Osegueda.

"Development of an Expert System for Fatigue and Fracture Evaluation of Steel Structures," UTEP-URI, 9/90 – 8/92, \$5,500.

## **VII. COURSES TAUGHT**

### **At UTEP**

UNIV 1301 Seminar/ Critical Inquiry  
CE 3215 Engineering Mechanics  
CE 3234 Mechanics of Materials  
CE 3343 Structural Analysis  
CE 3373 Probability and Statistics for Civil Engineers  
CE 3435 Structural Design I  
CE 3461 Structural Design II  
CE 1595 Graduate Seminar  
CE 3590 Reliability of Engineering Systems  
CE 3590 Advanced Steel Structural Design  
CE 3590 Advanced Concrete Design  
CE 3590 Structural Load Models  
CE 3525 Design of Structures for Dynamic Loads

### **At Universidad Autónoma de Ciudad Juárez**

Structural Analysis

## **VIII. GRADUATE THESES DIRECTED**

Gabriela Garcia, "Mid-rise Building Framing Systems Comparison", Master of Science in Civil Engineering, May 2007

Edgar Munoz, Master of Science in Civil Engineering, "Feasibility of Using Artificial Neural Networks and Analytical Data for Prediction of Damage Detectability on Aluminum Beams", December 2004

Lizeth Carrasco, " A Bayesian Method for Processing Modal Information for Damage Detection", May 2004.

Benjamin Lopez, "Quantification of Pitting Corrosion Using Fractal Theory," Master of Science in Civil Engineering, December 2001.

Hugo Pardo, "A Reliability-Based Method for Corrosion Quantification," Master of Science in Civil Engineering, December 2001.

Walter Alvarez, "Artificial Neural Network Models for Damage Detection Using Lamb Waves," Master of Science in Civil Engineering, December 1999.

Angel Urbina, "Probabilistic Analysis of Rechargeable Batteries in a Renewable Power Supply System," Master of Science in Civil Engineering, May 1999.

Thalia Yiasemis, "A Matlab Tool for Probabilistic Safety Factors Calibration," Master of Science in Civil Engineering, September 1997.

Javier Navarro, "Stanton Street Toll Plaza," (Graduate Project), Master of Science in Civil Engineering, August 1997.

David C. Doran, "Toward The Strength Characterization of Connections Employed in Reticulated Structures," Master of Science in Civil Engineering, August 1997.

Luis E. Perez, "Statistical Validation of a Plate Finite Element Model for Damage Detection," Master of Science in Civil Engineering, May 1997.

Javier Ernesto Avila, "A Geographic Information System for Expansive Soils," Master of Science in Civil Engineering, May 1996.

Jaime Ortiz, "Neural Networks in Damage Assessment Using Vibrational Measurements", Master of science in Civil Engineering, May 1996.

Jacobo Behar "Experimental and Analytical Behavior of Model Concrete Piers in Expansive Soils," Master of Science in Civil Engineering, July 1995

Susan Jutta Rosas, "Reliability-Based Calibration of Safety Factors for Fitness-for-Service Assessment of Pipeline Girth Welds", Master of Science in Civil Engineering, Master of Science in Civil Engineering, December 1995.

Hareesh Gowdappa, "Development of an Expert System for the Reliability Design of Piers in Expansive Soils," Master of Science in Civil Engineering, August 1994.

Octavio Melchor Lucero, "Development of a Prototype Expert System for Damage Assessment of Structural Concrete Elements," Master of Science in Civil Engineering, December 1993.

Thomas Stephenson, "Probabilistic Evaluation of a Vibrational NDE Damage Detection and Reliability Assessment Method," Master of Science in Civil Engineering, August 1993.

Vennalaganti Krishna Mohan. "Uncertainty Analysis of Remaining Life of Flexible Pavements," Master of Science in Civil Engineering, May 1993.

Jose Angel Pendones, "Analysis of Uncertainties Related to the Response of Piers in Expansive Soils," Master of Science in Civil Engineering, January 1992.

## **IX. UNIVERSITY SERVICE**

Faculty Fellow, NSF-ADVANCE Program (2005-Present)  
Admissions and Academic Standards Committee (2003-Present)  
UTEP's representative to the Texas Higher Coordinating Board, Engineering Field of Study Committee (2000-2002)  
Faculty Athletic Council (1999- present)  
Faculty Senate Executive Council (1999 – 2001)  
CARPE Committee (1998 – 2000, 2002 -2003)  
Advisory Committee to the Entering Students Program (1998-2000)  
Statistics and Probability for Engineers (MIE) Committee (1997- 2000)  
Student Organizations and Activities Committee (1995-1998)  
Faculty Senator (Sep 1994 – Aug 1996)  
Institutional Effectiveness Advisory Committee (SACS) (1994-1996)  
Member of Faculty Welfare Committee (1993 - 1996)  
Student Organization and Activities Committee (1994 – 1998)  
Center for Inter-American and Border Studies Advisory Committee (1993-1996)  
Member of Student Publication Committee (1992-1994)  
Member of Admissions and Academic Standards Committee (1992-1994, 2007 to date)  
Member of Undergraduate Curriculum Committee (2007 to date)

## **X. RECOGNITIONS**

Best Paper of Conference Award, SPIE Smart Structures and Materials Conference, March 2000.  
Professor of the Semester Award from ASCE Student Chapter, Fall 2001  
Professor of the Semester Award from ASCE Student Chapter, Spring 2000.  
Outstanding Civil Engineering Graduate Award from the Mexican Society of Civil Engineers, 1980.