

# ALBERTO MARQUEZ, PhD, P.E.

ASSOCIATE PROFESSOR  
DEPARTMENT OF INDUSTRIAL ENGINEERING  
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## Education

- Ph.D. 1999 *Arizona State University*  
Industrial and Management Systems Engineering  
Dissertation Title: "Mathematical programming models for agile manufacturing capacity planning in supply chains"  
Major: Operations Research.  
Minors: Management of Technology, Computer Integrated Manufacturing
- MS 1990 *Instituto Tecnológico y de Estudios Superiores de Monterrey.*  
Management Science
- BSE 1986 *Instituto Tecnológico y de Estudios Superiores de Monterrey.*  
Industrial and Systems Engineering

## Areas of interest

Systems performance, modeling and optimization of logistics and supply chain, combinatorial and stochastic optimization

## Academic Employment History

- 2013-  
Current *Associate professor*  
Lamar University. Industrial Engineering Department. Beaumont TX.
- 2007-2013 *Assistant professor.*  
Lamar University. Industrial Engineering Department. Beaumont TX.
- 2003 – 2006 *Department Chair.*  
Tecnologico de Monterrey. Industrial and Systems Engineering Department. Mexico City.

- 2000 – 2003 *Assistant Professor.*  
Tecnologico de Monterrey. Industrial and Systems Engineering Department. Mexico City.
- 1995 – 1999 *Research Assistant.*  
Industrial and Management Systems Engineering Department. Arizona State University. Tempe, AZ
- 1994-1995 *Teaching Assistant*  
Industrial and Management Systems Engineering Department. Arizona State University. Tempe, AZ

## RESEARCH

### Research accomplishments

- Total research grant funds awarded: \$327,045. US Dollars
- Twelve peer-reviewed journal papers,
- Eighteen peer-reviewed conference papers.
- Member of Mexican National Researchers System from 2004 to 2006.

### Grants and funded projects and synergistic activities

- Development of a Modeling framework for Risk-Informed Asset Management of the Port of Beaumont. Lamar University. \$29,109. November 2022
- A simulation approach to evaluate current port operations and optimize future operations through effective port asset management during construction and operations. Lamar University. \$21,733. November 2022
- “Benefit Cost Analysis of the Rebuild and Expansion of Transit Shed 1 project at the Port of Port Arthur”. Analysis Port Infrastructure Development Program of the Department of Transportation. \$3,000 August 2020
- “Reconstruction of Wharves 2, 3, and 4 and Addition of a Second Rail Line at the Port of Beaumont. INFRA 2019 Grant Application. \$3,000. August, 2019,
- Cost Effectiveness/Benefit Cost Analysis Summary. Benefit Cost Analysis Research and Development for Port of Beaumont – TIGER GRANT 2016” PI: Victor Zaloom Co-PI: Alberto Marquez, \$4,975. Sponsor: Port of

Beaumont, April 1, 2016– August 31, 2016

- “Benefit Cost Analysis Research and Development for Port of Beaumont – FASTLANE GRANT 2016” PI: Alberto Marquez Co-PI’s Victor Zaloom, \$4,975. Sponsor: Port of Beaumont, April 1, 2016– August 31, 2016
- Benefit Cost Analysis Research and Development for Port of Beaumont” PI: Victor Zaloom with Co-PI’s Alberto Marquez \$3,753. Sponsor: Port of Beaumont, June 1, 2015 – August 31, 2015.
- Research Grant \$191,500 - With Zhu, W. and Yoo, J.: Multimedia Learning of ‘Engineering Economics’ through Role Play Gaming on a Mobile Platform. Sponsor: NSF. May 2012, April 2016.
- Wood Procurement Optimization for a paper mill, PI: James Curry, Co-PI: Weihang Zhu, Alberto Marquez, \$10,000, June 2008 - November 2008.
- Research Ehnacement Grant. Lamar University for the proposal “Measuring Manufacturing Flexibility Elements. An information Theory Approach. 2007-2008 US 5,000.
- Grant for 50,000 US for the “Jalisco 2020: A technological survey on status and opportunities” State of Jalisco Government. 2004.

Submitted

- Marquez, A., Zhu, W., & Tokgoz, B., An Inventory Assigning Decision Support System for Hurricane Preparedness, Response and Resilience (\$ 375,743), Co-Principal Investigator, GOV-National Science Foundation (NSF). 2017

## **Publications**

Refereed

1. Varol, S, Marquez A. (2020). *An empirical study on assessing brand loyalty in automobile industry using hidden Markov model*. Academy of Marketing Studies Journal. Vol 24, 1.
2. Cruz-Mejía O., Márquez A., Monsreal-Barrera M.M. (2019) *Product Delivery and Simulation for Industry 4.0*. In: Gunal M. (eds) *Simulation for Industry 4.0*. Springer Series in Advanced Manufacturing. Springer, Cham.  
[https://doi.org/10.1007/978-3-030-04137-3\\_5](https://doi.org/10.1007/978-3-030-04137-3_5)

3. Ayberk Karakavuz, Berna Eren Tokgoz, Victor Zaloom, and Alberto Marquez. "Risk Assessment of Commonly Transported Chemicals in the Port of Houston", *Int. J. of Critical Infrastructures* 16(1) 2020. doi: 10.1504/IJCIS.2020.10024083.
4. Lonnie Turpin and Matiur Rahman and Alberto Marquez, (2016) "*Optimization over a collection of decision trees with three-valued outcomes*", *Economics Bulletin*, Volume 36, Issue 4, pages 1959-1965
5. Weihang Zhu, Alberto Marquez, Julia Yoo, "*Engineering Economics Jeopardy!*" *Mobile App for University Students*, *Journal of Engineering Economist*, Vol. 60, Issue 4, 2015, Pages: 291-306, DOI: 10.1080/0013791X.2015.1067343.
6. Bokhari, M.; Curry, J.; El-Houbi, A.; Chu, H.W.; Marquez, A.; Liu, X.: *A data to text framework for describing regression models: an optimization approach for content determination*. *International Journal of Business, Marketing, and Decision Sciences*. Vol. 8, Num 1. Fall 2015
7. Schulte C., Curry J., Zaloom V., Zhu W., Lou H., Marquez A. *Scheduling Hazardous Waste Incinerators Using a Simulated Annealing Linear Programming Heuristic*. *Environmental Engineering Science*. Vol. 27. Num 7. 2010
8. Zhu, Weihang, James Curry, Alberto Marquez, *SIMD Tabu Search with Graphics Hardware Acceleration on the Quadratic Assignment Problem.*, *The International Journal of Production Research*, 2010. Vol. 48, No.4, 1035-1047.
9. M. Caserta and A. Márquez *Tabu search based metaheuristic algorithm for software system reliability problems*, *Computers and Operations Research* Vol 36 (2008). Pp 811-822.
10. Caserta, M., Quiñonez, E., Marquez A. *A Cross Entropy Algorithm for the Knapsack Problem with Setups*, "*Computers and Operations Research*" Vol 35, Issue 1, January 2008, Pages 241-252
11. Cochran, J.K., Marquez A. *A set covering formulation for agile capacity planning within supply chains.*. *International Journal of Production Economics*. Vol. 95 (2005) pp 139-149.
12. Marquez, A. Cochran, K. Shunk D. *Two-stage simulation optimization for agile manufacturing capacity planning.*. *International Journal of Production Research*. Vol. 41 06/2003. 1181-1197

## Presentations

### Refereed

1. Long Y., **Marquez, A.** "Benchmarking Required Employability Skills Using Quantitative Analysis of Textual Data," in Proceeding of the 2021 IISE Engineering Lean and Six Sigma Conference, 2021.
2. Robert Kelley Bradley, James C Curry, Victor Zaloom, Brian Craig, Berna Eren Tokgoz, **Alberto Marquez**, Yueqing Li, Maryam Hamidi, Weihang Zhu, Xinyu Liu, and Acyut Kaneria. "Results of the First Six Years of a 2+2 Online BS Industrial Engineering Degree Pathway" Proc. of American Society for Engineering Education Virtual Annual Conference, July 2021.
3. Marquez A, Zaloom, V. (2020) "Benefit estimations of port terminal infrastructure rehabilitation and construction project" IISE Annual Conference to be presented in New Orleans May-June 2020.
4. Brake, Sehin, Wade, Valles, Marquez, Jimenez. (2020). *Cross-cultural engineering skill development at an international summer boot camp*. 127<sup>th</sup> ASEE Annual Conference. June 21-24 2020.
5. Bousaid, Z. & Marquez, A. (2017). *Determining Inventories of Relief Supplies During Disaster Response Operations by Predicting Non Linear Human Behavior With A System Dynamics Model*. INFORMS Annual Conference 2017, Houston, Texas.
6. Mahale, S., Marquez, A., & Zhu, W. (2017). *A client server framework for job-shop scheduling system to minimize tardiness and labor overtime costs under labor and machine constraints*. INFORMS Annual Conference 2017, Houston, Texas.
7. Varol, S, Marquez A. *The Use of Conditional Probability and Expected Value Functions to Maximize Earnings on Betting Games*. Academy of Business Research Conference October 2015
8. Varol, S. Marquez A. *A Novel Implementation of the Hidden Markov Model into Forecasting Brand Loyalty in Automobile Industry*. Proceedings of the 4th Annual World Conference of the Society for Industrial and Systems Engineering, Fort Lauderdale, Florida, USA. October 19-21, 2015

9. Marquez, A. "State based descriptors of manufacturing flexibility". Institute of Industrial Engineers Conference and Expo 2015. Nashville, TN. May-June 2015.
10. Marquez, A. "Industrial Engineering in the XXI century". Institute of Industrial Engineers Conference and Expo 2015. Nashville, TN. May-June 2015.
11. Brake, Sehin, Wade, Valles, Marquez, Jimenez. (2020). *Cross-cultural engineering skill development at an international summer boot camp*. 127<sup>th</sup> ASEE Annual Conference. June 21-24 2020.
12. Weihang Zhu, Alberto Marquez, Julia Yoo, *Development of Mobile App for Engineering Economics*, ASEE annual conference 2013, Atlanta, GA, USA
13. Zhu W., J. Curry, A. Marquez.. *GPU-accelerated SIMT Tabu Search for the Quadratic Assignment Problem*, , Transactions of SME/NAMRC 2009
14. Marquez, A.; Curry, J.; Zhu, W. *Setting Gate Prices with Intermediate Actors and Transportation Costs*. IIE Annual Conference 2010 Cancun Mex. June 5-9
15. Marquez A. Anindyo R., Underdown R. *Optimization of Facility Layout Design Using Heuristic Techniques*. 2009. IIE Annual Conference 2009 Miami Fl. May 30- June 3.
16. Márquez A. Cochran J.K. *A case study in process flexibility optimization through Maximum Entropy*. Proceedings: 1999 Industrial Engineering Research Conference. May 23-24, 1999. Phoenix, Arizona
17. Marquez, A.. Cochran, J. *Queueing Models with Time Varying Arrival Rate* . Proceedings : 31st Annual Simulation Symposium, April 5-9, 1998, Boston, Massachusetts, U.S.A. / Sponsored by Society for Computer Simulation International.

Non-refereed presentations and lectures by invitation

1. Marquez A. *Simulation and Supply Chain* as part of the Building Bridges for New Innovators in Engineering (BBNIE) project by Texas International Education Consortium / Texas State / Lamar University and Universidad Politecnica de Guanajuato. San Marcos, Texas. May 2019.
2. Marquez, A. (2017, October). *Intelligence for Industry 4.0: Heuristic Algorithms*. Congreso Internacional de Ingenieria, Trujillo, Peru.
3. Marquez A., Craig. B. *Port logistics*- CIITEC 2016. Puerto Progreso, Yucatan, Mexico. Sponsored by Instituto Tecnologico Superior Progreso, May 2016
4. Marquez, A. *Small investing decision making using spreadsheets*. International Congress of Industrial and Computer Engineering. Tecnologico de Monterrey, Campus Central de Veracruz. Mexico. April 2008.
5. Marquez, A. *Simulation using spreadsheets*. International Congress of Industrial and Computer Engineering. Tecnologico de Monterrey, Campus Central de Veracruz. Mexico. April 2005
6. Marquez, A. *The Industrial Engineer in logistics services. A prospective for the next 15 years*. VII Congreso Nacional de Ingeniería Industrial. November 2003. National college of Industrial Engineers (Mexico)
7. Marquez, A. *Industrial Engineering @ Real-Time*. Computers and industrial Systems Congress. Tecnologico de Monterrey. Campus Veracruz. May 2002

## TEACHING

### Doctor of Engineering Field Study Chairmanships

Yimei Long. *Applying Data Mining Techniques on Employability Skill Analysis of job posting*. Doctor of Engineering Field Study. Lamar University. Beaumont, TX. (Expected 2023)

Zeina Bousaid. *Determining Inventories of Medical Supplies During Disaster Response Operations with a System Dynamic Approach*. Doctor of Engineering Field Study. Lamar University. Beaumont, TX. 2018

Sujay Mahale. *Developing a Real Time Online Scheduling System for a Manufacturing Service Company: Achieving Visibility*. Doctor of Engineering Field Study. Lamar University. Beaumont, TX. 2017

Serkan Varol. *Implementation of Machine Learning Algorithms in the Context of Forecasting Brand Loyalty in Automobile Industry*. Doctor of Engineering Field Study. Lamar University. Beaumont, TX. 2016

Jaber Saeed Alzahrani: *Measuring Efficiencies and Economic Impact of Air Transportation Sector in the U.S Economy Using Data Envelopment Analysis and Leontief Model*. Doctor of Engineering Field Study. Lamar University. Beaumont, TX 2015.

### Master Thesis Chairmanships

Shankar Deo: *Methodology to implement lean manufacturing in cement industry*. Master Thesis. Lamar University. Beaumont, TX. 2013

Luis Mario Dominguez: *Adapting algorithms to solve the work load assignment problem measuring the productivity yield*. Master Thesis. Tecnologico de Monterrey Campus Ciudad de Mexico. 2006.

### Courses taught:

- |      |   |
|------|---|
| MSIE | • Simulation of I.E. Systems (Lamar U.)     |
| MEIE | • Capital Projects (Lamar U.)               |
| MEM  | • Operations Research (Lamar U.)            |
| DEIE | • Engineering in the XXI Century (Lamar U.) |
|      | • Advanced Engineering Economics (Lamar U.) |
|      | • Statistical Decision Making (Lamar U.)    |
|      | • Heuristic Algorithms (Lamar U.)           |



- Supply chain management (Lamar U.)
- Discrete event system simulation (ITESM)

BSIE

- Probability and Statistics (Lamar U.)
- Engineering Economics (Lamar U. & ITESM)
- Operations Management (ITESM)
- Production Management (ITESM)
- Stochastic Operations Research (ITESM)
- System Dynamics (ITESM)
- Statistical Quality Control (ITESM)
- Simulation (ITESM)
- Mathematical Modeling of Logistics Systems (ITESM)
- Supply Chain Management (ITESM and Lamar U.)
- Quality improvement (Lamar U.)

MBA Program:

- Supply Chain Management. (ITESM)

**Teaching grants**

- Online course development grant. Lamar University. For preparing the course “INEN 4357 Supply chain management” at the undergraduate level.
- Online course development grant. Lamar University. For preparing the course “INEN 2373 Engineering Economics” at the undergraduate level.
- Online course development grant. Lamar University. For preparing the course “INEN 5307 Capital Projects” with *Quality Matters* reviewed and approved at the graduate level.

**Teaching awards:**

Top 3% Transcendence in Teaching Award by ITESM ALUMNI. September 2018

## SERVICE & PROFESSIONAL DEVELOPMENT

### Affiliations

- Institute for Operations Research and Management Science
- Institute of Industrial Engineers
- Systems Dynamics Society

### Professional Service

- Faculty advisor for Lamar University Student Chapter of the Society of Hispanic Professional Engineers (2008- 2018)
- President of Section 1420 of the American Society for Quality (2011-2012)
- Secretary of Section 1420 of the American Society for Quality (2012-2019)
- Peer-reviewed journals reviewer:
  - International Journal of Production Research
  - IEEE Transactions on Systems Man and Cybernetics
  - IEEE Transactions on Automation Science and Engineering
- Text book publisher reviewer
  - John Wiley and sons

### University Service

- Undergraduate Curriculum Council (Lamar University 2017-2022)
- Director of the Master of Engineering Management program (Lamar University 2008-2022). Achievement: Growing the program from zero to over 50 students the largest graduate program in the COE
- Director of the B. Sc. Industrial Technology Program (2014-2015)
- Industrial Engineering Department representative at the Lamar University Faculty Senate 2011-2015
- Faculty Advisor for the Student Chapter of the Institute for Operations research and management science at Lamar University (2012-2015)
  - Ad-hoc committee for student retention
  - Ad-hoc committee for performance appraisal process (f2.08)
- Multicultural enhancement committee member 2012-13 (Lamar University)
- Advisor to the student chapter of the Society of Professional Hispanic Professional Engineers (Lamar University 2010 - 16)

- Faculty Advisor for the American Society for Quality
- Cardinal Tennis Club Advisor (Lamar University 2009-2010)
- University Curriculum and Academic Programs Committee (ITESM)
- Faculty recruiting committee chair (ITESM)
- Engineering School Academic Quality and Development Committee (ITESM)
- Faculty Advisor. Institute of Industrial Engineers student chapter (ITESM)
- Undergraduate Curriculum Council (Lamar University 2017-present)

### **Awards and Recognitions**

- Educational Transcendence Award. Tecnologico de Monterrey. Mexico City 2018
- University Merit Award 2013. Lamar University.
- Listed in Who's who in Science and Engineering, 2006, 2007, 2008.
- Member of the Researchers National System from National Council for the Sciences and Technology (Mexico), 2004-2006.
- Scholar awards and Scholarships:
  - Fulbright-Conacyt for 5 consecutive years to pursue a Ph.D. (Arizona State University)
  - Arizona State University. Out- of-State Tuition Academic Waiver
  - Arizona State University. Graduate Academic Scholarship
  - Procter & Gamble scholarship to study the M.Sc. Management Sciences 1988-1990
  - Tecnologico de Monterrey, To study the B.Sc. in Industrial and Systems Engineering. 1983-1986
  - Other Scholarships. National University of Mexico, Ministry of Education, MAI de México.
  - Academic Distinguished Performance Award from Tecnologico de Monterrey (Graduated with honors)

## INDUSTRIAL & CONSULTING EXPERIENCE

### Industry Employment History

- 2022 *Academic external consultant*  
*Confidential Port.*  
Benefit-Cost Analysis of the docks 40/41 rehabilitation of a Port in Houston extended metro area, construction of 1500 feet of expansion and rehabilitation of staging tracks and wye tracks, and 200-yard staging tracks, as part of the application to the Port Infrastructure Development Program 2022 (PIDP) Grant Program of the Maritime Administration of the Department of Transportation
- 2022 *Academic external consultant*  
*Port of Port Arthur*  
Benefit-Cost Analysis of the Stabilization of 23.7 Acre Lands with Building Renovation Project near the Port of Port Arthur, as part of the application to the Port Infrastructure Development Program (PIDP) Grant Program of the Department of Transportation 2022. The Port of Port Arthur was awarded \$13.6 million
- 2022 *Academic external consultant*  
*Port of Beaumont*  
2022 Port of Infrastructure Development Program Application. Beaumont-Houston Container on Barge Infrastructure Project Benefit Cost Analysis. The Port of Beaumont was awarded \$26.4 million project grant
- 2022 *Academic external consultant*  
*Port of Beaumont*  
Navigation District. Hazard Mitigation Grant Program Application Benefit Cost Analysis. Damages Associated With DR-4332-TX. Grant Program HMGP DR-4485-TX.
- 2021 *Academic external consultant*  
*Confidential Port.* Benefit-Cost Analysis of the Construction of four new tracks and a trespassing preventing fence and security system in Texas City, Texas, as part of the application to the Consolidated Rail Infrastructure and Safety Improvements 2021 (CRISI) Grant Program of the Federal Railroad Administration of the Department of Transportation

- 2021 *Academic external consultant*  
 Port of Port Arthur. Stabilization of 30.5 Acre Lands with Building Renovation Project near the Port of Port Arthur, as part of the application to the Port Infrastructure Development Program (PIDP) Grant Program of the Department of Transportation 2021 Department of Transportation. Economic impact of increased capacity and update in logistic facilities. The port of Port Arthur received a \$9.7 million investment grant
- 2020 *Academic external consultant*  
 Port of Port Arthur Benefit Cost Analysis of the Rebuild and Expansion of Transit Shed 1 project at the Port of Port Arthur". Analysis Port Infrastructure Development Program of the Department of Transportation. Economic impact of increased capacity and update in logistic facilities. \$13.9 million investment
- 2015-2016 *Academic external consultant*  
 Port of Beaumont. Economic impact of increased capacity and update in logistic facilities. 56 million investment
- 2008 *Academic external consultant.*  
 Confidential Paper Mill. Wood procurement forecasting and optimization model. Texas.
- 2006 *Academic external consultant.*  
 Instituto Federal Electoral. Data analysis and structured information for process coordinators. Mexico D.F.
- 2005 *Academic external consultant.*  
 Grupo Modelo. Advanced modeling, data analysis and decision making for better business analysis. Mexico D.F.
- 1999-2000 *Senior Consultant.*  
 IBM Canada Ltd. Supply Chain Implementation Practice. Certified in the Implementation of state-of-the-art Advanced Planning Systems APS. (i2 Technologies software), including Demand Planner, Supply Chain Planner and Factory planner. In-house Supply Chain Modeling and Planning project for small and medium systems distribution for Canada and the Caribbean
- 1998-1999 *Industrial Engineer*  
 Motorola Inc. (Phoenix, Arizona). Semiconductor Components Group.  
*(Contracted through Arizona State University).*  
 Research project on systems integration for decision support systems to production planning and control and aggregated capacity planning. Application development from APS output

using ORACLE SQL

- 1996-1997 *Industrial Engineer*  
Tefen USA consulting Motorola and Burr-Brown plants Phoenix, Tucson, and Chandler Arizona. Modeling and planning of semiconductor manufacturing capacity. Equipment efficiency and utilization studies. Layout design for semiconductor manufacturing
- 1992 -1993 *Operative Planning Manager*  
Auto-Glass Division. Vitro Group. OEM's and the export and national parts market. Operative plan for short and long term (aggregated planning). Budgets for safety glass for the automobile industry, both.
- 1990 – 1992 *Plant Manager.*  
Auto-Glass Division. Vitro Group. Production management of automobile laminated glass, including cutting, bending, assembly and finishing manufacturing processes, tools construction and development, quality assurance, production planning, plant maintenance. Supervision of over 120 employees and union workers. Responsible for budget, technology transfer programs, and quality certification.
- 1988 - 1990 *Traffic Department Manager*  
Procter & Gamble de Mexico  
Contracting, negotiation, and acquisition of transportation services. On-delivery invoicing processes.
- 1987 – 1988 *Purchasing, Distribution and Traffic Dept Supervisor.*  
Procter & Gamble de Mexico  
Supervision of physical inventory control, allocation and distribution. Planning shipments to warehouses and to customers. Shipments to special account customers (government agencies).
- 1985 -1986 *Internship.*  
Procter & Gamble de Mexico  
Development of specialized software for the personnel department for compensation studies, headcount, intercompany transfers.

**Community Service:**

- South East Texas Tennis Association board member 2009
- United States Tennis Associate Junior Team Tennis Coach 2008
- ISWEEEP science fair competition judge 2008-2009

