

## MANUEL A. NUNEZ

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### EDUCATION

- Ph.D. Operations Research, Sloan School of Management, Massachusetts Institute of Technology, 1997.
- Engineer Degree Operations Research, Department of Management Science and Engineering, Stanford University, 1990.
- M.S. Computer Science, Department of Computer Science, Stanford University, 1990.
- M.S. Operations Research, Department of Management Science and Engineering, Stanford University, 1989.
- M.S. Mathematics, School of Mathematics, University of Costa Rica, 1993.
- B.S. Computer Science, School of Computer Science, University of Costa Rica, 1987.
- B.S. Mathematics, School of Mathematics, University of Costa Rica, 1986.

### ACADEMIC EXPERIENCE

- Associate Professor, Department of Operations and Information Management, University of Connecticut, since 2007.
- Visiting Professor, School of Business, Fordham University, New York, Spring 2013.
- Assistant Professor, Department of Operations and Information Management, University of Connecticut, 2001-2007.
- Assistant Professor of Management Science, Argyros School of Business and Economics, Chapman University, California, 1997-2001.
- Teaching Assistant, Operations Research Center, Sloan School of Management, MIT, 1994-1997.
- Adjunct Professor, School of Computer Science, Costa Rica Institute of Technology, Costa Rica, 1988-1994.
- Adjunct Professor, School of Mathematics and School of Computer Science, University of Costa Rica, Costa Rica, 1983-1994.

### AREAS OF EXPERTISE AND RESEARCH

Operations research, statistical modeling and simulation, analytics and business intelligence, computer programming and data structures, machine learning, genetic algorithms, decision theory, decision support systems, operations management, supply chain management, convex optimization, stochastic models

## AWARDS

1. Best Paper Award for the paper "Managing Data Quality Risk in Accounting Information Systems," with X. Bai and J. Kalagnanam, U.Conn., September 2010.
2. Teaching Excellence Award, School of Engineering, U. Conn., September 2009.
3. Achievement award for support and mentoring of Sikorsky Aircraft Corporation and University of Connecticut, Sikorsky Aircraft Corporation, March 2007.
4. Winner of the best paper award for "Secure Electronic Markets for Private Information," with Daniel Rice, Robert Garfinkel, and Ram Gopal. Hawaii International Conference on System Sciences, January 2006.
5. Achievement award in recognition for successful completion of a turbine blade and vane production optimization project, Pratt and Whitney Aircraft Company, May 2003.
6. Achievement award in recognition for improving repair process of helicopter blades, Sikorsky Aircraft Corporation, May 2002.
7. Organization of American States Scholarship, 1996-97.
8. US Agency of International Development Scholarship, 1988-90.

## PUBLICATIONS

### Published Articles in Refereed Journals:

1. "A Decision Theoretic Foundation for Noise Traders and Correlated Speculation," with M. Schneider. *INFORMS Decision Analysis*, Vol. 21, No. 1, pages 4-22, March 2024.
2. "Incorporating Medication Therapy Management into Community Pharmacy Workflows," with Y. Chen, S. Gernant, and C. Upton. *Health Care Management Science*, Vol. 25, No. 4, pages 710-724, December 2022.
3. "Leveraging Slack Capacity in IaaS Contract Cloud Services," with X. Bai and L. Du. *Production and Operations Management*, Vol. 30, No. 4, pages 883-901, April 2021.
4. "Mean-Dispersion Preferences with a Specific Dispersion Function," with M. Schneider. *Journal of Mathematical Economics*, Vol. 84, pages 195–206, October 2019.
5. "Competition for Limited Critical Resources and the Adoption of Environmentally Sustainable Strategies," with H.-H. Lee and J. Cruz. *European Journal of Operational Research*, Vol. 264, No. 3, pages 1130-1143, February 2018.
6. "Managing Risk-Adjusted Resource Allocation for Project Time-Cost Tradeoffs," with R. Chiang and L. Kuo. Published Online in *Annals of Operations Research*, <https://doi.org/10.1007/s10479-016-2122-7>, November 2016.
7. "A Simple Mean-Dispersion Model of Ambiguity Attitudes," with M. Schneider. *Journal of Mathematical Economics*, Vol. 58, pages 25–31, May 2015.

8. "A Decision Methodology for Managing Operational Efficiency and Information Disclosure Risk in Healthcare Processes," with X. Bai, R. Gopal, and D. Zhdanov. *Decision Support Systems*, Vol. 57, pages 406–416, January 2014.
9. "Strategic Alignment and Value Maximization for IT Project Portfolios," with R. Chiang. *Information Technology and Management*, Vol. 14, No. 2, pages 143-157, June 2013.
10. "On the Prevention of Fraud and Privacy Exposure in Process Information Flow," with X. Bai, R. Gopal, and D. Zhdanov. *INFORMS Journal on Computing*, Vol. 24, No. 3, pages 416–432, Summer 2012.
11. "Managing Data Quality Risk in Accounting Information Systems," with X. Bai and J. Kalagnanam. *Information Systems Research*, Vol. 23, No. 2, pages 453-473, June 2012.
12. "Batch-Size Based Line Segmentation," with J. Cruz. *International Journal of Production Research*, Vol. 49, No. 17, pages 5099–5119, September 2011.
13. "Managing Information Security Risk in Business Processes," with X. Bai, R. Gopal, and D. Zhdanov. *International Journal of Decision Sciences*, Vol. 1, No. 1, pages 45-53, 2010.
14. "Business Process Integration of Multiple Customer Order Review Systems," with L. Chen. *IEEE Transactions on Engineering Management*, Vol. 57, No. 3, pages 502-512, August 2010.
15. "Efficient Short-Term Allocation and Reallocation of Patients to Floors of a Hospital during Demand Surges," with R. Garfinkel, S. Thompson, and M. Dean. *Operations Research*, Vol. 57, No. 2, pages 261-273, March-April 2009.
16. "Simulation of a Machining Sequence Using Delmia/Quest Software," with Z.M. Bzymek, M. Li, and S. Powers. *Computer-Aided Design and Applications*, Vol. 5, No. 1-4, pages 401-411, 2008.
17. "Stochastic Protection of Confidential Information in Statistical Databases: A Hybrid of Query Restriction and Data Perturbation," with R. Garfinkel and R. Gopal. *Operations Research*, Vol. 55, No. 5, pages 890-908, 2007. Chosen as *Operations Research Featured Article* in December 2007.
18. "Improving Web-Catalog Design for Easy Product Search," with R. Chiang. *INFORMS Journal on Computing*, Vol. 19, No. 4, pages 510-519, Fall 2007.
19. "Extreme Points and Conditioning of Well-Posed Polytopes." *Optimization*, Vol. 55, No. 3, pages 269-288, June 2006.
20. "Activity Structures in a Project-Based Environment: A Coordination Theory Perspective," with M. Meixell and A. Talalayevsky. *IEEE Transactions on Engineering Management*, Vol. 53, No. 2, pages 285-296, May 2006.
21. "Secure Electronic Markets for Private Information," with D. Rice, R. Garfinkel, and R. Gopal. *IEEE Transactions on Systems, Man and Cybernetics* Vol. 36, No. 3, pages 461-471, May 2006.
22. "A Characterization of Ill-Posed Data Instances for Convex Programming," *Mathematical Programming*, Vol. 91, No. 2, pages 375-390, January 2002.

23. "Condition-Measure Bounds on the Behavior of the Central Trajectory of a Semi-Definite Program," with R. Freund, *SIAM Journal on Optimization*, Vol. 11, No. 3, pages 818-836, November 2000.
24. "Condition Measures and Properties of the Central Trajectory of a Linear Program," with R. Freund, *Mathematical Programming*, Vol. 83, No. 1, pages 1-28, September 1998.

#### Articles Under Review and Work in Progress:

1. "Axiomatization and Learnability of a Non-Extreme-Outcome Expected Value Representation for Decision Making," with M. Schneider. To be submitted to *Econometrica*, May 2024.
2. "A Foundation for Noise Traders and Correlated Speculation," with M. Schneider. Work in progress, May 2024.

#### Refereed Proceedings:

1. "On the Vapnik-Chervonenkis Dimension and Learnability of the Hurwicz Decision Criterion," with M. Schneider. Proceedings of the International Federation of Classification Societies, Accepted March 2024.
2. "Cost-Benefit Analysis of Patient's Choice in Precision Medicine," with Y. Chen. Proceedings of the 50th Annual Conference of the Decision Sciences Institute, November 2019.
3. "Integrating the Case Method and Design Projects in the Industry-Sponsored Academic Education," with Z.M. Bzymek. Proceedings of the International Mechanical Engineering Congress and Exhibition, ASME 2014, Montreal, Canada, November 2014.
4. "Integrating Design and Production Problem-Solving in Industry-Sponsored Academic Education," with Z.M. Bzymek. Proceedings of the International Mechanical Engineering Congress and Exhibition, ASME 2013, San Diego, CA, November 2013.
5. "Strategic Alignment and Value Maximization for IT Project Portfolios," with R. Chiang. Proceedings of the Twentieth Workshop on Information Technologies and Systems (WITS), December 2010.
6. "Reducing Privacy Exposure in Healthcare Workflows," with X. Bai, R. Gopal, and D. Zhdanov. Proceedings of the Workshop on Health Information and Economics (WHITE), Washington, DC, October 2010.
7. "Strategic Planning and Project Selection for IT Portfolio Management," with R. Chiang. Proceedings of the 4th International Research Workshop on IT Project Management, 2009.
8. "Secure Electronic Markets for Private Information: Economic and Security Consideration," with R. Garfinkel, R. Gopal, and D. Rice. Proceedings of the Thirty-Ninth Hawaii International Conference on System Sciences (HICSS-39), Hawaii, January 2006.

9. "Sample Design in the Context of Data Security," with R. Garfinkel and R. Gopal. Proceedings of the European Conference on Quality and Methodology in Official Statistics (Q2004), May 2004.
10. "A Coordination Model for Time Efficiency Analysis in Organizations," with A. Talalayevsky, Proceedings of the 2002 Annual Meeting of the Decision Sciences Institute, August 2002.

#### Books and Chapters:

1. "Information Systems Security and Statistical Databases: Preserving Confidentiality through Camouflage," with R. Garfinkel, R. Gopal, and D. Rice. Chapter 12 of *Handbooks of Information Systems Volume 3 Series on Business Computing*, Emerald Group Publishing Limited, Bingley, UK, pages 319-346, 2009.
2. Instructor's Manual for the textbook "Data, Models, and Decisions, the Fundamentals of Management Science" by D. Bertsimas and R. Freund, South-Western College Publishing, 2000.

#### Dissertations:

1. "Condition Numbers and Properties of Central Trajectories in Convex Programming," Ph.D. dissertation. Advisor: Prof. Robert M. Freund, MIT, 1997.
2. "Experiments Using Ellipsoid Algorithm in Linear Programming," Engineer Degree thesis. Advisor: Prof. George B. Dantzig, Stanford University, 1990.

### **TEACHING EXPERIENCE**

#### Information Systems and Analytics:

1. Statistics in business analytics (OPIM 5603), M.S. level at U. Conn., Spring 2017, Fall 2017, Spring 2018, Fall 2019, and Spring 2024.
2. Independent Study: Information security risk management (OPIM 4899), undergraduate level at U.Conn., Fall 2016.
3. Introduction to data analytics (OPIM 5181), MBA level at U. Conn., Fall 2015, 2016, 2017, and 2018.
4. Core statistics (BADM 5180), MBA level at U. Conn., Fall 2015, 2016, 2017, and 2018.
5. Adaptive business intelligence (OPIM 5504), M.S. level at U. Conn., Fall 2013-2016, Fall 2018-2022.
6. Decision analysis and forecasting (MGSC 619), MBA level at Chapman U., Fall and Spring 1998-2000.
7. Introductory business statistics (MGSC 309), undergraduate level at Chapman U., Fall 1998-2000, Spring 1998-2001.
8. Quantitative methods for computer information systems (MATH 346), undergraduate level at Chapman U., Fall 1999.

### Operations Management and Manufacturing:

1. Computers in manufacturing (MEM 3231), undergraduate level at U. Conn., Spring 2002-2019, Spring 2021-2024, Fall 2019-2022.
2. Advanced manufacturing systems (MEM 4915W), MEM capstone course, undergraduate level at U. Conn., Spring 2002-2015.
3. Operations management (OPIM 3104), undergraduate level at U. Conn., Fall 2001-2006, 2014.
4. Research methods for operations and information management (OPIM 6201), doctoral level at U. Conn., Summer 2017.
5. Operations management seminar (OPIM 6202), doctoral level at U. Conn., Fall 2007, Spring 2011, 2015, and Fall 2021.
6. Operations management (BADM3761), online course for the Business Administration minor, undergraduate level at U. Conn., Fall 2009-2013.
7. Seminar in supply chain (OPIM 5894SC), MBA level at U. Conn., Fall 2008.
8. Senior design project 1 (MEM 4971W), MEM capstone course, undergraduate level at U. Conn., Fall 2015 and 2016.
9. Principles of engineering management (MEM2221), online course for the Engineering Management minor, undergraduate level at U. Conn., Fall 2009-2013.

### **RESEARCH GRANTS**

“Creation of a Laboratory for Research and Teaching of Industrial Modeling,” with Z. Bzymek. Founded by the *Connecticut Center for Advanced Technology, Catalyst Grant Program of the National Aerospace Leadership Initiative*, for an amount of \$44,200. April 2008.

### **ADVISING**

1. Doctoral:
  - Major Advisor for “Essays on Healthcare Management.” Student: Yucheng Chen, Defended July 2019.
  - Associate Advisor for “Predicting Ultimate Targets with Time-Dependent Predictors.” Student: Wei Fu, Defended December 2016.
  - Co-Advisor for “Essays on Decision Making under Risk in Decision Theory and Auction Theory.” Student: Mark Schneider, Defended April 2015.
  - Co-Advisor for “Essays on Healthcare Information Systems.” Student: Steven Thompson, Defended May 2005.

- Associate Advisor for “Discrete Optimization with Objective Functions Learned Through Predictive Modeling.” Student: Teng Huang, in progress 2018-2019.
  - Member of the advising committee in the qualifying paper of thirteen doctoral students.
2. Pontificia Universidad Católica del Perú: Member of the advisory group of the Office of the Vice President for Research. Since March 2013.
  3. Edgelab: Faculty advisor for the project “Supply Chain Variation,” sponsored by General Electric Energy Group. Summer 2010.
  4. UConn Honors Program: Eleven students in “Computers in Manufacturing,” since 2006; one student in “Operations Management,” Fall 2006; and five students in “Advanced Manufacturing Systems,” Spring 2007-2010, and 2015.
  5. Management and Engineering for Manufacturing (MEM) Program: Faculty advisor for the MEM Student Society, 2004 and 2006.
  6. Departmental Student Advisor: Advised 40 students 2001-2006.

### INVITED LECTURES/SEMINARS/CONFERENCES

1. “Strategic Pricing and Capacity Planning in Cloud Computing Markets,” with X. Bai and L. Du. INFORMS Meeting, Minneapolis, October 2013.
2. “Strategic Alignment, Outsourcing, and Value Maximization for IT Project Portfolios,” with R. Chiang. Gabelli School of Business, Fordham University, February 2013.
3. “Operationalizing Sustainable Production Strategies Subject to Diminishing Resources,” with H.-H. Lee and J. Cruz. INFORMS Meeting, Phoenix, October 2012.
4. “Seminar on Adaptive Business Intelligence.” Centro de Investigaciones en Tecnologías de la Información y Comunicación, University of Costa Rica, August 2012.
5. “Challenges in the Development of Secure Information Markets.” Centro de Investigaciones en Tecnologías de la Información y Comunicación, University of Costa Rica, August 2012.
6. “Managing Operational Efficiency and Information Disclosure Risk in Workflow Processes,” with X. Bai, R. Gopal, and D. Zhdanov. INFORMS Meeting, Charlotte, November 2011.
7. “Managing Data Quality Risk in Accounting Information Systems,” with X. Bai and J. Kalagnanam. INFORMS Meeting, Austin, November 2010.
8. “Innovating Operations Management.” Lecture seminar at the V Semana Internacional, CENTRUM, Pontificia Universidad Católica. Lima, Perú, September 6-9, 2010.
9. “Optimal Workflow Design with Security Considerations,” with X. Bai, R. Gopal, and D. Zhdanov. Quinnipiac University, November 2009.
10. “A New Groebner Basis Algorithm to Solve the Inference Problem in Statistical Database Security.” INFORMS Meeting, San Diego, October 2009.

11. "An Algebraic Algorithm to Solve the Inference Problem in Statistical Databases." School of Mathematics, University of Costa Rica, August 2009.
12. "Security Risk Management of Confidential Information in Social Networks." INFORMS Meeting, Washington DC, October 2008.
13. "Batch-Size Based Line Segmentation," with J. Cruz. INFORMS Meeting, Seattle, November 2007.
14. "Improving Web-Catalog Design for Easy Product Search," with R. Chiang. University of Wyoming, January 2007.
15. "Efficient Short-Term Allocation of Patients to Floors of a Hospital During Demand Surges," with S. Thompson, R. Garfinkel, and M. Dean. INFORMS Meeting, Pittsburgh, November 2006.
16. "Improving Search in Online Catalogs," with R. Chiang. Universidad Nacional de Costa Rica and Universidad Latina de Costa Rica, July 2005.
17. "Electronic Markets for Private Information," with R. Garfinkel, D. Rice, and R. Gopal. OPIM Seminar Series, University of Connecticut, November 2004.
18. "A Pricing Model for DB Queries under Security Constraints." INFORMS Meeting, Denver, October 2004.
19. "A New Statistical DB Algorithm to Protect Confidential Data," with R. Garfinkel and R. Gopal. Universidad Nacional de Costa Rica and Universidad Latina de Costa Rica, July 2004.
20. "Sample Design in the Context of Data Security," with R. Garfinkel and R. Gopal. European Conference on Quality and Methodology in Official Statistics (Q2004), Mainz, Germany, May 2004.
21. "Data Protection and Accuracy on Statistical Database Systems," with R. Garfinkel and R. Gopal. DSI Meeting, Washington D.C., November 2003.
22. "Data Protection and Accuracy on Statistical Database Systems," with R. Garfinkel and R. Gopal. INFORMS Meeting, Atlanta, October 2003.
23. "Optimal Sampling Design in Hypothesis Testing," with R. Garfinkel. Invited Seminar, Department d'Estadística i Investigació Operativa, Universitat Politècnica de Catalunya, Barcelona, Spain, March 2003.
24. "Data Perturbation and Recovery on Statistical Database Systems." INFORMS Meeting, San Jose, CA, November 2002.
25. "Large-Sample Analysis of Linear Programming under Random Data Perturbations." INFORMS Meeting, San Antonio, November 2000.
26. "Condition Numbers and Infeasible Convex Programs." INFORMS Meeting, Salt Lake City, May 2000.
27. "Time Efficiency in Organizations and Markets," with A. Talalayevsky, INFORMS Meeting, Philadelphia, November 1999.
28. "A Characterization of Ill-Posed Data Instances for Convex Programming." INFORMS Meeting, Cincinnati, May 1999.
29. "Stability of the Central Trajectory of a Semi-definite Program under Data Perturbations." INFORMS Meeting, Seattle, October 1998.
30. "International Trade with Costa Rica: Internet Resources." Costa Rica-US Chamber of Commerce, Los Angeles, June 1998.



31. "Time Efficiency and Organizational Delaying," with A. Talalayevsky. Proceedings of the Western Decision Science Institute Conference, Reno, April 1998.
32. "Large-Sample Analysis of Linear Programming under Random Data Perturbations." INFORMS Meeting, Montreal, April 1998.
33. "Complexity of an Interior-Point Method based on the Distance to Degeneracy," with R. Freund. INFORMS Meeting, San Diego, May 1997.
34. "Bounds on the Curvature of the Central Trajectory of a Linear Program, using Condition Numbers," with R. Freund. INFORMS Meeting, Atlanta, November 3-6, 1996.
35. "Condition Measures and Properties of the Central Trajectory of a Linear Program," with R. Freund. INFORMS Meeting, Atlanta, November 1996.
36. "Condition Measures and Properties of the Central Trajectory of a Linear Program," with R. Freund. SIAM Conference on Optimization, Victoria, British Columbia, May 1996.
37. "Condition Numbers and Properties of the Central Trajectory of a Semidefinite Program," with R. Freund. Workshop on Semidefinite Programming and Interior-Point Approaches for Combinatorial Optimization Problems, The Fields Institute for Research and Mathematical Sciences, Toronto, May 1996.
38. "Genetic Algorithms for Production Planning and Scheduling." Invited course lecture at MIT, May 1995.
39. "Applications of Genetic Algorithms to Optimization Problems." Computer Science Colloquium, Costa Rica Institute of Technology, Costa Rica, June 1994.

## UConn Service

- OPIM PhD Coordinator, 2018-2022.
- Chair of the School of Business Research Computing Committee, 2014-2015.
- Member of the UConn's National Center of Academic Excellence in Information Assurance Research, since 12/2009.
- OPIM PhD Program Admissions Coordinator, 08/2008-08/2012 and 08/2016-08/2022.
- Engineering Management Minor Program Coordinator, 08/2008-08/2014.
- Member of the Accreditation Committee for the MEM Program, since 2007.
- Assisted in the faculty recruiting process for several candidates, throughout 2004-2007.
- Promoted MEM program in the School of Business Open House event during every year since 2003.
- Participated in Commencement Ceremonies in 2002, 2004, 2005, 2008, 2012, and 2016.
- Member of the School of Business Teaching and Research Excellence Committee, 2007.
- Member of the departmental Recruiting Committee, since 08/2007.

- Member of the departmental Promotion and Tenure Review Committee, 2007, 2022-2024.
- Member of the departmental Doctoral Program Committee, since 08/2005.
- Member of the departmental Undergraduate Program Committee, since 07/2003.
- Member of the School of Business Undergraduate Curriculum Committee, 2003, 2012.

## MEMBERSHIPS

Former member of the following organizations:

- Institute for Operations Research and the Management Sciences (INFORMS), 1997-2020.
- Mathematical Optimization Society (MOS), 1994-2018.
- Society for Industrial and Applied Mathematics (SIAM), 1989-2020.
- Society of Manufacturing Engineers (SME), 2019-2023.

## REFEREE WORK

1. MIS Quarterly: one manuscript.
2. INFORMS Information Systems Research: five manuscripts.
3. INFORMS Journal on Computing: three manuscripts.
4. INFORMS Mathematics of OR: one manuscript.
5. Information Systems Frontiers: one manuscript.
6. IEEE Transactions on Engineering Management: one manuscript.
7. Journal of Global Optimization: one manuscript.
8. Journal of Optimization Theory and Applications: one manuscript.
9. Linear Algebra and Applications: one manuscript.
10. Management Science: four manuscripts.
11. Mathematical Programming: five manuscripts.
12. MIS Quarterly: one manuscript.
13. SIAM Journal on Optimization: two manuscripts.
14. WITS: three manuscripts.
15. CLEI (Conferencia Latinoamericana de Informática): nine manuscripts.
16. Vicerrectorado de Investigación, Pontificia Universidad Católica del Perú: seven research project proposals.

## OTHER SKILLS

- Software: C/C++, VB/VBA, Delphi, MS Project, MS Visio, Rockwell Arena Simulation, R, R Excel, R Shiny.
- Languages: Spanish (fluent)

## OTHER INTERESTS

- Professional sports: LA Lakers, LA Dodgers, NE Patriots, FC Bayern Munich, Liga Deportiva Alajuelense.
- Reading: history, general physics, general biology, science fiction, Star Trek.
- Hobbies: board games, jigsaw puzzles, crossword puzzles, model kits, card games, tarot, Rubik cube.
- Computer games: Civilization, chess, Risk.

*Last modified: May 13, 2024.*