Daniel F. Otero-Leon

Ph.D. Candidate
@ University of Michigan

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Employment

Universidad de los Andes, Bogota, Colombia
Instructor, Industrial Engineering — 8/2012-6/2018

Education

PhD, Industrial and Operations Engineering — Expected 2022
University of Michigan, Ann Arbor, MI

M.Sc. Industrial Engineering — 6/2012
Universidad de los Andes, Bogota, Colombia

B.Sc. Industrial Engineering — 6/2010
Universidad de los Andes, Bogota, Colombia

Research Experience

University of Michigan, Ann Arbor, MI
Graduate Student Research Assistant, Department of Industrial and Operations Engineering — 8/2018-Current

Universidad de los Andes, Bogota, Colombia
Research Assistant, Industrial Engineering Department — 8/2012-6/2018
Undergraduate Research Assistant, Industrial Engineering Department — 1/2010-6/2010

Research Interests

My research interests are generally in operations research and, more specifically, in the area of stochastic models and stochastic dynamic programming with applications to service systems. My dissertation research is in data-driven models for improving decision-making in the context of cardiovascular disease, with the help of clinical collaborators at the U.S. Department of Veteran Affairs. I am currently analyzing longitudinal electronic medical record data and pharmacy claims data to optimize appointment monitoring policies.

Methodology

Predictive modeling, data-driven optimization, dynamic programming, bandit models, stochastic optimization.

Applications

Medical decision-making, cardiovascular disease, personalized medicine, revenue management, airline applications.

Publications

Journal Articles

1. **D. F. Otero** and R. Akhavan-Tabatabaei (2015). A stochastic dynamic pricing model for the multiclass problems in the airline industry. *European Journal of Operational Research* **242**(1), 188–200.
2. **D. F. Otero**, M. Escallon, C. Lopez, and R. Akhavan-Tabatabaei (2019). Optimal timing of airline promotions under dilution. *European Journal of Operational Research* **277**(3), 981–995

Working Papers

1. **D. F. Otero-Leon**, M. S. Lavieri, B. T. Denton, J. Sussman, and R. A. Hayward (2020). Monitoring policy in the context of preventive treatment of cardiovascular disease. *Healthcare Management Science* (Target Journal)
2. **D. F. Otero-Leon**, M. S. Lavieri, B. T. Denton, J. Sussman, and R. A. Hayward (2020). Dynamic Updating For Prediction Models For Medication Adherence. *Medical Decision Making* (Target Journal)

Presentations

Invited Talks and Seminars

1. "Stochastic Dynamic Programming: Applications in the Airline Industry and Healthcare Sector."
   - ➤ The Group for Applied Mathematical Modeling and Analytics seminar, University of Buffalo, March 2020
2. "Workshop: Introduction to Revenue Management"
   - ➤ Analytics Forum, Universidad de los Andes, Bogota, Colombia, March 2018
3. "An optimum pricing policy for a multiclass problem in the airline industry"
   - ➤ Taller de procesos estocásticos, Universidad Nacional, September 2013

Conference Presentations

1. **D. F. Otero-Leon**, M. S. Lavieri, and B. T. Denton (2020). Dynamic Updating For Prediction Models For Medication Adherence. *INFORMS Annual Meeting*, Virtual
2. **D. F. Otero-Leon**, M. S. Lavieri, and B. T. Denton (2019). Cholesterol Follow-up Policy in the Context of Preventive Treatment of Cardiovascular Disease. *INFORMS Annual Meeting*, Seattle, WA
3. **D. F. Otero-Leon**, M. S. Lavieri, B. T. Denton, A. Gavica, J. Sussman, and R. A. Hayward (2019). Cholesterol Follow-up Policy in the Context of Preventive Treatment of Cardiovascular Disease. *INFORMS Healthcare*, Boston, MA
4. C. Quiroga, **D. F. Otero-Leon**, and A. Medaglia (2017). A Stochastic Optimization Model for Fleet Assignment under Uncertainty Conditions. *INFORMS Annual Meeting*, Houston,TX
5. **D. F. Otero-Leon**, M. Escallon, C. Lopez, and R. Akhavan-Tabatabaei (2016). A Pricing Model To Optimize The Promotions Period In Airlines. *INFORMS Annual Meeting*, Nashville, TN
6. **D. F. Otero-Leon** and R. Akhavan-Tabatabaei (2013). A Pricing Model To Optimize The Promotions Period In Airlines. *INFORMS Annual Meeting*, Minneapolis, MN
7. **D. F. Otero-Leon** and R. Akhavan-Tabatabaei (2012). An optimum pricing policy for a multiclass problem in the airline industry. *INFORMS Annual Meeting*, Phoenix, AZ
8. **D. F. Otero-Leon** and R. Akhavan-Tabatabaei (2012). An optimum pricing policy for a multiclass problem in the airline industry. *IX Congreso Latinoamericano IIE*, Bogota, Colombia
9. **D. F. Otero-Leon** and R. Akhavan-Tabatabaei (2010). Role of higher moments in the accuracy of G/G/m approximations. *INFORMS Annual Meeting*, Austin, TX
10. **D. F. Otero-Leon** and R. Akhavan-Tabatabaei (2010). Role of Higher Moments of Arrival and Service Time in G/G/m Approximations. *ALIO-INFORMS*, Buenos Aires, Argentina

Poster Presentations

1. **D. F. Otero-Leon**, M. S. Lavieri, and B. T. Denton (2020). Effects of follow-up policies on statin adherence. *Michigan Student Symposium for Interdisciplinary Statistical Sciences*, Ann Arbor, MI
2. I. Mura, K. D. Angulo, M. F. Cortes, **D. F. Otero-Leon**, and R. Akhavan-Tabatabaei (2017). Supporting the Definition and Analysis of Cervical Cancer Public Health Policies. *INFORMS Annual Meeting*, Houston, TX

Awards and Honors

Universidad de los Andes Business Ideas Contest - Second Place	2010
Latin-American simulation contest with FLEXSIM - Third Place	2009
Univerisdad de los Andes ICTs Innovation Contest - First Place	2008

Grants and Funding

Rackham Travel Grant — Fall 2019
Amount Awarded: $800

INFORMS Student Leadership Conference — 2019
Amount Awarded: $200

Teaching Experience

University Teaching

I have teaching experience with the following courses at the University level:

- IIND 2104: Stochastic Modelling, Universidad de los Andes
- IIND 2109: Decision Analysis Tools, Universidad de los Andes
- IIND 3107: Marketing Engineering, Universidad de los Andes
- IIND 3113: Discrete Event Simulation, Universidad de los Andes
- ISIS 1204: Algorithms and Object-Oriented Programming I, Universidad de los Andes

Course	Position	Semester	Instructor Rating	College-wide Average	Response
IIND 2104	Instructor	2018-10	4.4/5.0	4.3	103/109
IIND 3107	Instructor	2018-10	4.7/5.0	4.3	21/22
IIND 2104	Instructor	2017-20	4.4/5.0	4.3	108/114
IIND 3113	Instructor	2017-20	4.4/5.0	4.3	61/68
IIND 2104	Instructor	2017-10	3.65/4.0*	NA	113/116
IIND 3107	Instructor	2017-10	3.58/4.0*	NA	29/29
IIND 3113	Instructor	2017-10	3.66/4.0*	NA	63/65
IIND 2104	Instructor	2016-20	3.77/4.0	NA	57/59
IIND 2109	Instructor	2016-20	3.61/4.0	NA	49/49
IIND 3113	Instructor	2016-20	3.59/4.0	NA	49/51
IIND 2104	Instructor	2016-10	3.77/4.0	NA	61/63
IIND 2109	Instructor	2016-10	3.72/4.0	NA	37/37
IIND 3113	Instructor	2016-10	3.89/4.0	NA	41/44
IIND 2104	Instructor	2015-20	3.58/4.0	NA	93/97
IIND 3113	Instructor	2015-20	3.78/4.0	NA	43/46
IIND 2109	Instructor	2015-10	3.69/4.0	NA	82/87
IIND 2104	Instructor	2014-20	3.82/4.0	NA	56/58
IIND 2109	Instructor	2014-20	3.72/4.0	NA	81/82
IIND 2104	Instructor	2014-10	3.66/4.0	NA	94/99
IIND 2104	Instructor	2013-20	3.74/4.0	NA	93/115
IIND 2104	Instructor	2013-10	3.62/4.0	NA	76/106
IIND 2104	Instructor	2012-20	3.60/4.0	NA	44/96
IIND 2104	TA	2010-20	NA	NA	NA
IIND 2104	UTA	2010-10	NA	NA	NA
IIND 2104	UTA	2009-20	NA	NA	NA
IIND 2104	UTA	2009-10	NA	NA	NA
IIND 2104	Grader	2008-20	NA	NA	NA
ISIS 1204	UTA	2007-20	NA	NA	NA
ISIS 1204	UTA	2007-10	NA	NA	NA
ISIS 1204	UTA	2006-20	NA	NA	NA

TA: Teaching Assitant, UTA: Undergraduate Teaching Assistant
*For the second semester of 2017, Universidad de los Andes changed their evaluation system.

Advisory Activities

Masters Research Supervision

Stochastic Dynamic Programming

1. D. López (2017). A stochastic dynamic pricing model for massive consumption products. *Universidad de los Andes*, Bogota, Colombia. Co–Advised with Ivan Mura
2. C. López (2015). Pricing model to optimize the promotions period in airlines. *Universidad de los Andes*, Bogota, Colombia. Co–Advised with Raha Akhavan–Tabatabaei

Stochastic Optimization

1. S. Cardenas (2017). Optimización de políticas de promociones multiproducto con canibalización. *Universidad de los Andes*, Bogota, Colombia. Co–Advised with Andrés Medaglia
2. C. Quiroga (2017). A stochastic optimization model for aircraft scheduling under uncertainty during operational times. *Universidad de los Andes*, Bogota, Colombia. Co–Advised with Andrés Medaglia

Machine Learning

1. D. Alzate and J. Cerero (2017). Análisis del poder predictivo de variables sociodemográficas para clasificar resultados de citología cervicouterina en población colombiana. *Universidad de los Andes*, Bogota, Colombia. Co–Advised with Ivan Mura
2. J. C. Varayoud and J. E. Perez (2017). Modelo de tratamiento persuasivo para el pago de parafiscales en Colombia- UGPP. *Universidad de los Andes*, Bogota, Colombia. Co–Advised with Gonzalo Torres

Undergraduate Research Supervision

Optimization

1. P. Rojas (2018). Programación Óptima de Cartelera que maximice la asistencia de Procinal en el Multiplex Álamos, en Bogotá. *Universidad de los Andes*, Bogota, Colombia
2. D. A. Jimenez (2016). Metodología de implementación revenue management para el sector hotelero. *Universidad de los Andes*, Bogota, Colombia
3. A. Cardona (2015). Política óptima para la oferta de tiquetes en la industria deportiva. *Universidad de los Andes*, Bogota, Colombia
4. A. España (2015). Modeling capacity allocation. A revenue management approach for Innomed S.A. *Universidad de los Andes*, Bogota, Colombia
5. V. Urrea (2015). Asignación de sillas para una empresa de transporte terrestre de pasajeros del eje cafetero. *Universidad de los Andes*, Bogota, Colombia
6. J. E. Valenzuela (2014). Hotel room optimal pricing strategy based on the bid price curve. *Universidad de los Andes*, Bogota, Colombia
7. A. F. Montoya (2013). Optimal customer's class segmentation for the rooms in a hotel. Blue Doors Hotels case study. *Universidad de los Andes*, Bogota, Colombia

Probability and Statistics

1. M. A. Caicedo (2018). Herramienta de apoyo a la decisión para el análisis de las fluctuaciones de la participación de mercado. *Universidad de los Andes*, Bogota, Colombia
2. J. Uribe (2018). Aplicación del modelo de Bass con modificaciones por estacionalidad, efectos de marketing y recompra para pronósticos de ventas de productos nuevos. *Universidad de los Andes*, Bogota, Colombia
3. L. Castiblanco and P. Ruiz (2017). Estimación de las probabilidades de restricción de operación en aeropuertos de Colombia por condiciones meteorológicas. *Universidad de los Andes*, Bogota, Colombia
4. D. Vargas (2017). Aproximación numérica al fenómeno de canibalismo de marca. *Universidad de los Andes*, Bogota, Colombia
5. J. F. Pieschacón (2016). Implementación de revenue management y pronósticos de demanda para productos de consumo masivo. *Universidad de los Andes*, Bogota, Colombia
6. M. Escallon (2015). Input data distribution estimations for a pricing model to optimize the duration of promotion periods for airlines. *Universidad de los Andes*, Bogota, Colombia
7. J. J. Pineda (2015). Cálculo de la tasa óptima de overbooking para hoteles. *Universidad de los Andes*, Bogota, Colombia
8. J. D. Daza (2013). Continental hotel demand recapture estimation. *Universidad de los Andes*, Bogota, Colombia
9. J. F. Imbett (2013). On the price elasticity of demand in hotel revenue management: A case study in the Colombian hotel sector. *Universidad de los Andes*, Bogota, Colombia

Simulation

1. A. F. Otero (2017). Simulación del turnaround para el aeropuerto El Dorado de Bogotá. *Universidad de los Andes*, Bogota, Colombia
2. M. F. Cortés (2017). Modelo epidemiológico para la evaluación de políticas de detección temprana del cáncer de cuello uterino en Colombia. *Universidad de los Andes*, Bogota, Colombia
3. A. Ardila (2017). Ampliación del modelo compartimentado de simulación para la evaluación de políticas de vacunación contra vph en Colombia. *Universidad de los Andes*, Bogota, Colombia
4. C. Avellaneda (2015). Simulación de eventos discretos aplicada a una explotación. Explotación productora de leche Alameda Farm. *Universidad de los Andes*, Bogota, Colombia

Professional Development

NextProf Engineering, University of Michigan, Ann Arbor, MI 2020
INFORMS Student Leadership Conference, Baltimore, MD 2019

Industry Experience

ImecTech SAS, Bogota, Colombia
Revenue Management Consultant 1/2015-5/2017

Yield Optimization Intelligence, Bogota, Colombia
Entrepreneur 1/2014-12/2014

Avianca, Bogota, Colombia
Market Analysis Specialist 1/2011-6/2012

Service Activities

Journal Refereeing

Operations Research, Industrial Engineering, and Management Science Journals

- Journal of Intelligent Transportation Systems: Technology, Planning, and Operations

Service to the Profession

Institute for Operations Research and the Management Sciences (INFORMS)
Session Chair, *Health Application Society Session*, INFORMS Annual Meeting 2020
Session Chair, *Aviation Applications Session*, INFORMS Annual Meeting 2017

Service to the University

INFORMS Student Chapter, University of Michigan
President 2021
Vice President and Treasurer* 2020
Social Chair* 2019

IISE Student Chapter, Universidad de los Andes
Faculty Co-Advisor 2017-2018

*Received INFORMS Student Chapter Award at *Summa Cum Laude* level