

## **Juan Pablo Loaiza Ramírez**

Purdue University – Brian Lamb School of Communication  
Communication and Cognition Lab  
West Lafayette, IN 47906, USA  
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### **EDUCATION**

- M.A.,** Purdue University, *Expected graduation: August 6<sup>th</sup>, 2022*  
Major area: Organizational Communication  
Minor areas: Consumer Behavior, Sustainability  
Committee: Torsten Reimer (Chair), Ph.D., Hwanseok Song, Ph.D.,  
Carlos Eduardo Moreno Mantilla, Ph.D.  
Thesis Title: The Role of the Comfort Halo Effect, Protected Values and  
Demographics when Appraising Renewable Energy Sources
- M.Sc.,** Universidad Nacional de Colombia, October 28<sup>th</sup>, 2020  
Major area: Industrial Engineering  
Minor area: Green and Sustainable Supply Chain Management  
Thesis Title: Do Consumers Care about Green Supply Chain Management  
(GSCM) Practices? The Role of the Protected Values and the  
Halo Effect in Product's Evaluation (<https://rb.gy/batyaj>)  
*Meritorious Thesis (GPA 4.6 out of 5)*  
Committee: Carlos E. Moreno-Mantilla, Ph.D., (Chair), Torsten Reimer,  
Ph.D., (Co-chair), Ana Beatriz Lopes de Sousa Jabbour, Ph.D.,  
Devika Banerji, Ph.D.
- B.Eng.,** Universidad Nacional de Colombia, April 11<sup>th</sup>, 2018  
*Industrial Engineer (GPA 4.5 out of 5)*
- High School** Central Technical Institute La Salle, December 07<sup>th</sup>, 2011  
Technological High School Diploma –Systems and Computation  
*Best High School Graduate*

### **RESEARCH**

#### **Publications**

- Loaiza-Ramírez, J. P.,** Moreno-Mantilla, C. E., & Reimer, T. (2022). Do consumers care about companies' efforts in greening supply chains? Analyzing the role of protected values and the halo effect in product evaluation. *Cleaner Logistics and Supply Chain*, 3, 100027. <https://doi.org/10.1016/j.clscn.2021.100027>
- Loaiza-Ramírez, J. P.,** Moreno-Mantilla, C. E., Martínez-Valenzuela, V., Agelvis-Santos, I. D., & Steele-Parada, J. (2019). Comportamiento proambiental de los estudiantes: Factores que

lo influncian. In A. L. Molina-Soler, A. Parra, & A. Salas-Montoya (Eds.), *LA CIUDAD – REGIÓN SOSTENIBLE COMO PROYECTO: DESAFÍOS ACTUALES. VISIONES CRUZADAS Y PERSPECTIVAS* (pp. 182–189). Bogotá: Universidad Nacional de Colombia, ISBN: 978-958-783-904-3, URL: <https://bit.ly/2XWIW4P>

Quiroga-Calderón, L. M., Mejía-Salazar, I. S., Moreno-Mantilla, C. E., & **Loaiza-Ramírez, J. P.** (2018). Integration with Secondary Stakeholders and Its Relationship with Sustainable Supply Chain Practices in Colombian SMEs. *European Journal of Sustainable Development*, 7(4), 131-145. doi:10.14207/ejsd.2018.v7n4p131

Moreno-Mantilla, C. E., Mejía-Salazar, I. S., **Loaiza-Ramírez, J. P.**, Leguízamo-Díaz, T. P., & Romero-Larrahondo, P. A. (2018). Development and Validation of a Green Supply Chain Management Taxonomy in Colombian SMEs. In B. Sánchez Lara, R. Torres Mendoza, & J. Gómez Maturano (Eds.), *International Congress on Logistics & Supply Chain – CiLOG* (pp. 361–368). Ciudad de México: Asociación Mexicana de Logística y Cadenas de Suministro, A.C., ISBN: 978-607-96403-0-9

Rojas-Huérffano, L. F., **Loaiza-Ramírez, J. P.**, Rondero-Loso, L. A., & Astaiza-Amado, L. G. (2018). Metodología para la construcción de instrumentos en la caracterización de cadenas productivas. Caso de estudio: Aguacate Hass y Caña Panelera en Cauca – Colombia. In B. Sánchez Lara, R. Torres Mendoza, & J. Gómez Maturano (Eds.), *International Congress on Logistics & Supply Chain – CiLOG* (pp. 402–410). Ciudad de México: Asociación Mexicana de Logística y Cadenas de Suministro, A.C., ISBN: 978-607-96403-0-9

### Manuscripts Under Review

Reimer, T., Banerji, D., Roland, C., **Loaiza-Ramírez, J. P.** Signage Matters: Comparing the Effects of Tailored and General Prompts on Recycling Behaviors in an Experimental Field Study. Submitted to *Social Influence*

**Loaiza-Ramírez, J. P.**, Moreno-Mantilla, C.E., Reimer, T. When Green Energy Feels Cozy: Protected Values' Moderation of Halo Effects in Energy Preferences. Submitted to *Energy Research & Social Science*

### Conference Presentations

**Loaiza-Ramírez, J. P.**, Reimer, T., & Moreno-Mantilla, C. E. (2022). *Consumers' Perceived Comfort and Protected Values in Green Electricity Appraisal*. Presentation presented at the Midwestern Psychological Association – MPA 2022, 21-23<sup>rd</sup> April, Chicago, IL, USA.

**Loaiza-Ramírez, J. P.**, Reimer, T., & Moreno-Mantilla, C. E. (2021). *Using Protected Values and the Halo Effect to Explain Consumers' Decision-Making when Evaluating Electric Utilities' Energy Sources*. Paper presented at the 107th Annual NCA Convention - National Communication Association: Renewal and Transformation, 18-21<sup>st</sup> November, Seattle, WA, USA.

- Loaiza-Ramírez, J. P.,** Reimer, T., & Moreno-Mantilla, C. E. (2021). *Using Protected Values and the Halo Effect to Explain Consumers' Decision Making when Evaluating Electricity Providers' Energy Sources*. Presentation presented at the International Sustainable Development Research Society – ISDRS 2021, 13-15<sup>th</sup> July, Virtual Conference.
- Loaiza-Ramírez, J. P.,** Reimer, T., & Moreno-Mantilla, C. E. (2021). *Protected Values and the Halo Effect in Consumer Product Evaluation*. Poster presented at the Midwestern Psychological Association – MPA 2021, 22-24<sup>th</sup> April, Virtual Conference.
- Loaiza-Ramírez, J. P.,** Reimer, T., & Moreno-Mantilla, C. E. (2021). *Do Consumers Care about Companies' Green Supply Chain Management (GSCM) Efforts? Analyzing the Role of Protected Values and the Halo Effect in Product Evaluation*. Paper presented at the CGSA Conference and Tompkin's Distinguished Lecture, Purdue University, 12<sup>nd</sup> March, Virtual Conference.
- Loaiza-Ramírez, J. P.,** Reimer, T., & Moreno-Mantilla, C. E. (2020). *Is it Better because it is Green? A Mediation Analysis of Green Supply Chain Management Halo Effect on Product Evaluations*. Paper presented at the NCA 106th Annual Convention - National Communication Association: Communication at the Crossroads, 19-22<sup>nd</sup> November, Virtual Conference.
- Loaiza-Ramírez, J. P.,** Reimer, T., & Moreno-Mantilla, C. E. (2020). *Do Consumers Care about Companies' Green Supply Chain Management (GSCM) Efforts? Analyzing the Role of Protected Values and the Halo Effect in Product Evaluation*. Paper presented at the 70th Annual ICA Conference - International Communication Association, 21-25<sup>th</sup> May, Virtual Conference.
- Loaiza-Ramírez, J. P.,** Moreno-Mantilla, C. E., & Reimer, T. (2019). *Do Consumers Care about Green Supply Chain Management (GSCM) Efforts when Evaluating Product Performance? Analyzing the Role of Protected Values and the Halo Effect*. Presentation presented at VI International Congress of Industries and Organizations – Impacts and Perspectives of the 4<sup>th</sup> Industrial Revolution – CIIO 2019, 22-23<sup>rd</sup> August, Cartagena, Colombia.
- Loaiza-Ramírez, J. P.,** Osorio-Ramírez, C., Rocha-González, J. E., Muñoz-González, C. M. & Quinto-Moya, L. (2019). *Health Care Supply Chain Management: Scientometrics, Literature Review and Research Agenda in an Emerging Economy*. Presentation presented at VI International Congress of Industries and Organizations – Impacts and Perspectives of the 4<sup>th</sup> Industrial Revolution – CIIO 2019, 22-23<sup>rd</sup> August, Cartagena, Colombia.
- Castrellón-Torres, J. P., **Loaiza-Ramírez, J. P.,** Numpaque-Cano, J. S., & Vega-Vega, D. A. (2019). *Modeling Urban Freight Transport for Restrictions Evaluation from the Private Sector Perspective: A Simulation Study*. Presentation presented at VI International Congress of Industries and Organizations – Impacts and Perspectives of the 4<sup>th</sup> Industrial Revolution – CIIO 2019, 22-23<sup>rd</sup> August, Cartagena, Colombia.

- Reimer, T., Banerji, D., Roland, C., & **Loaiza-Ramírez, J. P.** (2019). *Signage Matters: Comparing the Effects of Tailored and General Prompts on Recycling Behaviors in an Experimental Field Study*. Paper presented at the 69th Annual ICA Conference - International Communication Association, 24-28<sup>th</sup> May, Washington, D.C., USA.
- Moreno-Mantilla, C. E., Mejía-Salazar, I. S., **Loaiza-Ramírez, J. P.**, Leguizamo-Díaz, T. P., & Romero-Larrahondo, P. A. (2018). *Development and Validation of a Green Supply Chain Management Taxonomy in Colombian SMEs*. Paper presented at the International Congress on Logistics & Supply Chain – CiLOG 2018, 10-12<sup>th</sup> October, Ciudad de México, México.
- Rojas-Huérffano, L. F., **Loaiza-Ramírez, J. P.**, Rondero-Loso, L. A., & Astaiza-Amado, L. G. (2018). *Metodología para la construcción de instrumentos en la caracterización de cadenas productivas. Caso de estudio: Aguacate Hass y Caña Panelera en Cauca - Colombia*. Paper presented at the International Congress on Logistics & Supply Chain – CiLOG 2018, 10-12<sup>th</sup> October, Ciudad de México, México.
- Quiroga-Calderón, L. M., Mejía-Salazar, I. S., Moreno-Mantilla, C. E., & **Loaiza-Ramírez, J. P.** (2018). *Integration with Secondary Stakeholders and Its Relationship with Sustainable Supply Chain Practices in Colombian SMEs*. Paper presented at 6<sup>th</sup> International Conference on Sustainable Development 2018 – ICSD 2018, 12-13<sup>th</sup> September, Rome, Italy.
- Loaiza-Ramírez, J. P.**, & Moreno-Mantilla, C. E. (2018). *Customer Behavior and Green Supply Chain Management (GSCM): A Literature Review*. Presentation presented at V International Congress of Industries and Organizations – Industry and Logistics for Development 2018 – CIIO 2018, 01-03<sup>rd</sup> August, Bogotá D.C., Colombia.
- Mejía-Salazar, I. S., Moreno-Mantilla, C. E., Aguilar-Zambrano, J. J., Trujillo-Suárez, M., **Loaiza-Ramírez, J. P.**, Sanguino-Díaz, M. C., Castellanos-Martínez, J. S., Guerrero-Aguilera, D. F., & Quiroga-Calderón, L. M. (2018). *Validation of a participant selection method within an explanatory sequential design for case studies of sustainable supply chains*. Presentation presented at V International Congress of Industries and Organizations – Industry and Logistics for Development – CIIO 2018, 01-03<sup>rd</sup> August, Bogotá D.C., Colombia.
- Reimer, T., & **Loaiza-Ramírez, J. P.** (2017). *Recycle or Trash Bin? Modeling Students' Recycling Behaviors in a Field Study*. Presentation and Poster presented at the Research Meeting, Faculty of Engineering, Universidad Nacional de Colombia, 17-18<sup>th</sup> October, Bogotá D.C., Colombia.
- Loaiza-Ramírez, J. P.**, Castro, J. S., & Cruz-Aldana, L. J. (2017). *5s como metodología de gestión eficiente para el mejoramiento en el proceso de recolección de fresa, en el departamento de Cundinamarca, Colombia*. Paper presented at IV International Congress of Industries and Organizations – Industrial Engineering and Supply Chain Management for Sustainable Development – CIIO 2017, 17-18<sup>th</sup> August, Medellín, Colombia.

- Reimer, T., **Loaiza-Ramírez, J. P.**, Roland, C., & Banerji, D. (2017). *Recycling or Trash Bin? Modeling Consumers' Recycling Behavior in a Field Study*. Poster presented at the 39<sup>th</sup> Annual Meeting of the Cognitive Science Society – CogSci 2017, 26-29<sup>th</sup> July, London, UK.
- Reimer, T., & **Loaiza-Ramírez, J. P.** (2017). *Recycle or Trash Bin? Modeling Students' Recycling Behaviors in a Field Study*. Presentation presented at the International Colloquium «Colloque international France - Colombie. La ville durable comme projet: enjeux contemporains. Regards croisés et perspectives», 26-28<sup>th</sup> July, Lyon, France.
- Holmes, M., Reimer, T., & **Loaiza-Ramírez, J. P.** (2017). *Recycling Behaviors Across Tight and Loose Cultures*. Poster presented at the Undergraduate Research & Poster Symposium, Purdue University, 11<sup>th</sup> April, West Lafayette, IN, USA.
- Loaiza-Ramírez, J. P.**, Moreno-Mantilla, C. E., Martínez-Valenzuela, V., Agelvis-Santos, I. D., & Steele-Parada, J. M. (2017). *Comportamiento proambiental de los estudiantes: Factores que lo influyen*. Paper and Poster presented at the I International Interdisciplinary Colloquium: Colombia – France «La ciudad–Región sostenible como proyecto: desafíos actuales. Visiones cruzadas y perspectivas», 13-15<sup>th</sup> March, Bogotá D.C., Colombia
- Reimer, T., **Loaiza-Ramírez, J. P.**, Banerji, D., & Roland, C. (2017). *Modeling Recycling Behavior Through the Audit of Disposed Items: Benefits and Methodological Challenges of Field Studies on Environmental Behavior*. Paper presented at the Building Sustainability Workshop, Purdue University, 7<sup>th</sup> March, West Lafayette, IN, USA.
- Reimer, T., & **Loaiza-Ramírez, J. P.** (2016). *Recycle or Trash Bin? Modeling Students' Recycling Behavior in a Field Study*. Poster presented at the Undergraduate Research & Poster Symposium, Purdue University, 12<sup>th</sup> April, West Lafayette, IN, USA.

## ACADEMIC APPOINTMENTS

- Research Assistant** Spring 2016, Spring 2021 - Spring 2022  
 Communication and Cognition Lab  
 Brian Lamb School of Communication, Purdue University
- Teaching Assistant** Spring 2015, Fall 2016, Spring & Fall 2017  
 Department of Systems and Industrial Engineering  
 School of Engineering, Universidad Nacional de Colombia

## SERVICE

Ad-hoc Reviewer, *International Communication Association (ICA) Conference, 2022*

Ad-hoc Reviewer, *National Communication Association (NCA) Conference, 2022*

Ad-hoc Reviewer, *Kybernetes, 2022*

## TEACHING

**Business Process Management Notation (BPMN) Short Course**

Fall 2019

- Course offered to the Superintendence of Transport in Colombia for one month (4 session per week, 4 hours each one)

## RESEARCH PROJECTS/ADMINISTRATIVE EXPERIENCE

### Purdue University

**Research Participation System Administrator**

Spring 2021-Spring 2022

Brian Lamb School of Communication | Communication and Cognition Lab

Director: Torsten Reimer

- Managed an online system for in-lab and online studies.
- Managed database of students participating in research projects.
- Worked with instructors to recruit students.

**Research Assistant**

Spring 2021-Spring 2022

National Science Foundation (NSF) Smart and Connected Communities Project

Supervisor: Torsten Reimer

- Collected data for studies via Amazon's Mechanical Turk program.
- Presented research projects to both faculty team members and graduate students.
- Assisted in reporting to grant managers on research activities.

### Universidad Nacional de Colombia

**Work Team member**

Fall 2019

- Project "Structuring a Solidarity Economy Think Tank" for the Superintendence of Solidarity Economy in Colombia.
- I worked in the processes and quality teamwork, which created the management and control model of the data and information of the Think Tank.

**Research Team member**

Spring-Fall 2019

- Project “Technologies in demand management and logistics operation for the health care network in the coastal region of the department of Chocó, Colombia. An approach from the beneficiary toward institutionality.”
- I worked as a research team member, conducting the state-of-the art, part of the data collection and the data analysis.

**Research Team member**

Fall 2017-Fall 2018

- Project “Integration with external secondary stakeholders and their relationship with advanced sustainable practices in Colombian SMEs supply chains.”
- I worked as a research assistant, conducting part of the data collection and the data analysis. I helped write one paper, which was published.

**Research Lead member**

Fall 2018

- Project “Characterization and analysis of the loading and unloading of goods in the city center of Neiva, to identify alternatives to improve mobility” in Colombia.
- I was one of the lead researchers, guiding the research team in the data collection, the data analysis, and the public presentations.

**Service Provision Contracts**

Evaluation and proposal of an urban freight restriction in Bogotá D.C. Spring-Fall 2019

- Specialist in urban logistics modelling for the development of the project “Evaluation and proposal of an urban freight restriction in Bogotá D.C.” in Colombia.
- I was part of the consulting team that modelled the urban freight restrictions of the private sector in Bogotá. The project included a simulation model and its documentation.

Strengthening the Research and Extension system  
of the Universidad Nacional de Colombia

Fall-Spring 2017

- Provide technical services for the project “Strengthening the Research and Extension system of the Universidad Nacional de Colombia.”
- I was part of the technical team that tested the Research and Extension system. The tests included reporting software bugs and problems to the engineer developers.

**Chair Assistantships**

Fall 2017

- Chair Assistant at the Chair *José Celestino Mutis* – “Multiple Facets of the Orinoquía Region” in Universidad Nacional de Colombia.
- I was one of the five chair assistants. My tasks included preparing the logistics/materials for the class and grading the students’ assignments.

**Administrative Assistantships**

Extension and Research Institute Spring 2017  
 School of Engineering – Universidad Nacional de Colombia

Department of Systems and Industrial Engineering Fall-Spring 2017  
 School of Engineering – Universidad Nacional de Colombia

Extension and Research Vice Dean’s Office Fall 2016, 2015  
 School of Engineering – Universidad Nacional de Colombia

- As an administrative assistant, I was responsible for the document filing and management, along with the documentation of the processes.

**PROFESSIONAL/RESEARCH AFFILIATIONS**

**Communication and Cognition Lab** Spring 2016, Spring 2021 – Spring 2022  
 Brian Lamb School of Communication – Purdue University

**Research Group Society, Economy and Productivity (SEPRO)** Fall 2018 – Fall 2019  
 School of Engineering – Universidad Nacional de Colombia

**AWARDS AND HONORS**

Ross Fellowship – Most Outstanding Applicants for Academic Excellence 2022  
 Brian Lamb School of Communication – Purdue University

Phi Kappa Phi Honor Society Member 2022

Best Graduate GPAs 2019  
 School of Engineering – Universidad Nacional de Colombia

Best Undergraduate GPAs 2012 – 2015, 2017  
 School of Engineering – Universidad Nacional de Colombia

Scholarship “Nexo Global Research Experience” 2016  
 Universidad Nacional de Colombia, Purdue University & Colombian U.S. Embassy

**GRANTS**

Department of Systems and Industrial Engineering Travel Grant, 2019  
 School of Engineering – Universidad Nacional de Colombia

- This travel grant provides financial assistance to industrial engineering graduate students attending the ICA Conference. \$910

Department of Systems and Industrial Engineering Travel Grant, 2018  
School of Engineering – Universidad Nacional de Colombia

- This travel grant provides financial assistance to industrial engineering graduate students attending the CiLOG 2018 congress. \$490

Department of Systems and Industrial Engineering Travel Grant, 2017  
School of Engineering – Universidad Nacional de Colombia

- This travel grant provides financial assistance to industrial engineering graduate students attending the International Colloquium France - Colombia. \$670

Nexo Global Research Grant, Purdue University-Universidad Nacional de Colombia 2016

- This research grant provides financial assistance to undergraduate Colombian students for researching at Purdue University. \$10,000-\$12,000

### **GRADUATE COURSEWORK**

COM 682 - Multivariate Statistics

- Dr. Brett Sherrick, Brian Lamb School of Communication, Purdue University

COM 574 - Organization Communication

- Dr. Seungyoon Lee, Brian Lamb School of Communication, Purdue University

COM 582 - Descriptive/Experimental Research in Communication

- Dr. Torsten Reimer, Brian Lamb School of Communication, Purdue University

COM 590 - Directed Study – Environmental Psychology: A Decision-Making Perspective in Residential Energy Consumption

- Dr. Torsten Reimer, Brian Lamb School of Communication, Purdue University

COM 674 - Introduction to Programming and Data Science

- Dr. Jeremy Foote, Brian Lamb School of Communication, Purdue University

COM 318 - Principles of Persuasion

- Dr. Jennifer Hoewe, Brian Lamb School of Communication, Purdue University

COM 590 - Directed Study – Consumers' Decision-Making and Cognitive Approaches in Energy Conservation

- Dr. Torsten Reimer, Brian Lamb School of Communication, Purdue University

COM 674 - Decision Making

- Dr. Torsten Reimer, Brian Lamb School of Communication, Purdue University

COM 676 - Risk Communication

- Dr. Hwanseok Song, Brian Lamb School of Communication, Purdue University

2027950 Urban Planning for City Logistics

- Juan Pablo Castrellón-Torres, M.Sc., Department of Systems and Industrial Engineering, Universidad Nacional de Colombia

2019816 Directed Course – Research Methodology and Structural Equation Modelling

- Dr. Carlos Eduardo Moreno-Mantilla, Department of Systems and Industrial Engineering, Universidad Nacional de Colombia

2020067 Companies and Environment

- Dr. Carlos Eduardo Moreno-Mantilla, Department of Systems and Industrial Engineering, Universidad Nacional de Colombia

2020070 Contemporary Strategic Management

- Dr. Christian Johannes Bruszies, Department of Systems and Industrial Engineering, Universidad Nacional de Colombia

2025668 Operations Management and Technological Innovation

- Dr. Gloria Isabel Rodriguez-Lozano, Department of Business and Administration, Universidad Nacional de Colombia.

### SHORT-TERM COURSES

**Extension Project Management – Coordination Level**  
Research Vice-Rectorcy – Universidad Nacional de Colombia

February 08<sup>th</sup>, 2019

**Copyrights and Author’s Rights in the Face of  
the New Developments in the Creative Industries**  
School of Law – Universidad Nacional de Colombia

July 13-25<sup>th</sup>, 2015

### ONLINE COURSES

**Specialization**      **John Hopkins University, December 19<sup>th</sup>, 2020**  
*Data Science* (<https://bit.ly/3qW1a01>)

**Ensino Híbrido: Personalização e Tecnologia na Educação**  
*Hybrid Teaching: Personalization and Technology in Education*  
Fundação Lemann and Instituto Península (<https://bit.ly/3vBtRCZ>)

October 27<sup>th</sup>, 2020

- Origens da Vida no Contexto Cósmico** September 30<sup>th</sup>, 2020  
*Origins of Life in the Cosmic Context*  
Universidade de São Paulo (<https://bit.ly/3qUUnUo>)
- A prática da gestão de clubes e federações esportivas** September 15<sup>th</sup>, 2020  
*The practice of managing sports clubs and federations*  
Fundação Instituto de Administração (<https://bit.ly/3lqGtYK>)
- Saúde Baseada em Evidências, com honores** August 13<sup>th</sup>, 2020  
*Evidence-Based Health, with honors*  
Universidade Estadual de Campinas (<https://bit.ly/3bTTIyb>)
- Pluralidades em Português Brasileiro** July 01<sup>st</sup>, 2020  
*Pluralities in Brazilian Portuguese*  
Universidade Estadual de Campinas (<https://bit.ly/3eQZH8P>)
- A complexidade sensível: Um paralelo entre videogames e arte** June 22<sup>nd</sup>, 2020  
*Sensitive Complexity: A Parallel Between Video Games and Art*  
Universidade Estadual de Campinas (<https://bit.ly/3tx3Dj7>)

## REFERENCES

**Torsten Reimer, Ph.D.**, Full Professor of Communication  
Brian Lamb School of Communication,  
Purdue University 100 N. University St.  
West Lafayette, IN, USA  
[treimer@purdue.edu](mailto:treimer@purdue.edu)

**Carlos Eduardo Moreno-Mantilla, Ph.D.**, Associate Professor of Engineering  
Faculty of Engineering, Department of Systems and Industrial Engineering,  
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Bogotá D.C., Colombia  
[cemorenoma@unal.edu.co](mailto:cemorenoma@unal.edu.co)