

Jose Daniel Morcillo Bastidas  
Departamento de Ingeniería Mecánica y Eléctrica  
Vicerrectoría Académica



## Research interests

José D. Morcillo B. received the Ph.D. in Computer Sciences from the Universidad Nacional de Colombia. He is currently working as a full-time professor at the Department of Engineering in University of Monterrey, Mexico. His research interest include: Applied Mathematics, Modeling, Simulation, Analysis and Control of Complex Systems, Data Analytics, Machine Learning, Power Electronics and Electricity Markets.

## Qualifications

Postdoctorate, Postdoctoral Researcher, Analítica de datos aplicada a la integración masiva de fuentes no convencionales de energía renovable en el mercado eléctrico colombiano., Universidad Nacional de Colombia  
10 Jun 2019 → 10 Jun 2020  
Award Date: 10 Jun 2020

Doctorate, PhD, Variability effect of the renewable generation on the electricity markets performance, Universidad Nacional de Colombia  
23 Jan 2014 → 18 Dec 2017  
Award Date: 6 Feb 2018

Master of Science, Master of Science in Engineering - Industrial Automation, Analysis and bifurcations of a dc-dc buck converter controlled by sine wave, Universidad Nacional de Colombia  
1 Aug 2010 → 11 Dec 2012  
Award Date: 11 Dec 2012

Electronics, Electronic Engineer, Universidad Nacional de Colombia  
1 Aug 2005 → 24 Aug 2010  
Award Date: 24 Aug 2010

## Employment

### Departamento de Ingeniería Mecánica y Eléctrica

Universidad de Monterrey  
Mexico  
1 Jan 2020 → present

### Vicerrectoría Académica

Universidad de Monterrey  
Mexico  
1 Jan 2020 → present

## Research outputs

### Experimental research on the performance of a BIPV system operating in Girardot, Colombia

Restrepo, S. A., Morcillo, J., Castaneda, M., Zapata, S. & Aristizábal, A. J., Sept 2023, In: Energy Reports. 9, p. 194-204 11 p.

### Simulation of the Environmental and Socio-economic Impact from the Lithium Industry within Producing Countries

Martínez, C. J., Reyes, M. F., López, C. D. & Morcillo, J. D., 18 Jul 2023, *Proceedings of the International Conference on Industrial Engineering and Operations Management*.

### Improvement of the Internal Audit Planning System in an IT Company through Predictive Analytics

Navarro, P. A. Z., Miller, R. A. R., Zuazua, R. S. & Morcillo, J. D., 15 Jun 2023, *Proceedings of the International Conference on Industrial Engineering and Operations Management*.

### **Assessing the speed, extent, and impact of the diffusion of solar PV**

Morcillo, J., Castaneda, M., Jiménez, M., Zapata, S., Dyer, I. & Aristizabal, A. J., Nov 2022, In: Energy Reports. 8, p. 269-281 13 p.

### **Automobile Technological Transition Scenarios Based on Environmental Drivers**

García, J. S., Morcillo, J. D., Redondo, J. M. & Becerra-Fernandez, M., 1 May 2022, In: Applied Sciences (Switzerland). 12, 9, 4593.

### **Control of Bubbling Phenomenon in Bipolar SPWM Inverters**

Abella, A. F., Morcillo B., J. D. & Angulo, F., 6 Dec 2021, *16th International Conference on Dynamical Systems - Theory and Applications*. Dynamical Systems Theory and Applications

### **Non-smooth dynamics in ramp-controlled and sine-controlled buck converters**

Morcillo B., J. D., Muñoz, J. G. & Tost, G. O., 6 Dec 2021, *16th International Conference on Dynamical Systems - Theory and Applications*. Dynamical Systems Theory and Applications

### **Simulation and Analysis of Renewable and Nonrenewable Capacity Scenarios under Hybrid Modeling: A Case Study**

Morcillo, J. D., Angulo, F. & Franco, C. J., 1 Jul 2021, In: Mathematics. 9, 13, 1560.

### **Simulation and Analysis of Complex Behaviors in a DC-DC Buck Converter**

Bastidas, J. D. M., Muñoz, J. G. & Tost, G. O., Jan 2021, In: IEEE Latin America Transactions. 19, 1, p. 68-74 7 p., 9423848.

### **Bubbling phenomenon in a unipolar SPWM inverter**

Abella, A. F., Morcillo, J. D. & Angulo, F., 2021, *Proceedings of the 2021 IEEE 5th Colombian Conference on Automatic Control, CCAC 2021*. Martínez, D. M. O. & Alfonso, L. F. C. (eds.). Institute of Electrical and Electronics Engineers Inc., p. 169-173 5 p. (Proceedings of the 2021 IEEE 5th Colombian Conference on Automatic Control, CCAC 2021).

### **Diseño e implementación de modelos de pronóstico para estimar la demanda de bebidas en tiendas de conveniencia**

Morcillo, J. D., Burgos, A. P., Garza, M., Obregón, S. & Galindo, Á., 2021, *19th LACCEI International Multi-Conference for Engineering, Education Caribbean Conference for Engineering and Technology: "Prospective and Trends in Technology and Skills for Sustainable Social Development" and "Leveraging Emerging Technologies to Construct the Future", LACCEI 2021 - Proceedings*. Larrondo Petrie, M. M., Zapata Rivera, L. F. & Aranzazu-Suescun, C. (eds.). Latin American and Caribbean Consortium of Engineering Institutions, (Proceedings of the LACCEI international Multi-conference for Engineering, Education and Technology; vol. 2021-July).

### **Non-Smooth Dynamics in Energy Market Models: A Complex Approximation From System Dynamics and Dynamical Systems Approach**

Valencia-Calvo, J., Olivar-Tost, G., Morcillo Bastidas, J. D., Franco-Cardona, C. J. & Isaac, D., 13 Jul 2020, In: IEEE Access. 8, p. 128877-128896 20 p., 9139234.

### **Analyzing the hydroelectricity variability on power markets from a system dynamics and dynamic systems perspective: Seasonality and ENSO phenomenon**

Morcillo, J. D., Angulo, F. & Franco, C. J., May 2020, In: Energies. 13, 9, 2381.

Simulation of demand growth scenarios in the Colombian electricity market: An integration of system dynamics and dynamic systems: An integration of system dynamics and dynamic systems

Morcillo B., J. D., Franco, C. J. & Angulo, F., 2018, In: Applied Energy. 216, p. 504-520 17 p.

Bubbling in a power electronic inverter: Onset, development and detection: Onset, development and detection

Avrutin, V., Morcillo B., J. D., Zhusubaliyev, Z. T. & Angulo, F., 1 Nov 2017, In: Chaos, Solitons and Fractals. 104, p. 135-152 18 p.

Delays in electricity market models

Morcillo B., J. D., Franco, C. J. & Angulo, F., 1 Jun 2017, In: Energy Strategy Reviews. 16, p. 24-32 9 p.

Adaptive Ramp Technique for Controlling Chaos and Subharmonic Oscillations in DC-DC Power Converters

Morcillo B., J. D., Burbano, D. & Angulo, F., Jul 2016, In: IEEE Transactions on Power Electronics. 31, 7, p. 5330-5343 14 p., 7289467.

**About the use of delays in electricity market models through a system dynamics approach**

Morcillo B., J. D., Franco-Cardona, C. J. & Angulo, F., 19 Jul 2015, *Thirty-third International System Dynamics Conference*. System Dynamics Society

Using bifurcation diagrams for controlling chaos

Morcillo B., J. D., Burbano, D., Angulo, F. & Olivar, G., 1 Jan 2014, p. 77-84. 8 p.

Description and comparison of non-smooth bifurcations in a ramp-controlled and sine-controlled buck converter

Morcillo B., J. D. & Olivar, G., 2012.

Coexistence of Solutions in a DC-DC Buck converter controlled by sine wave

Morcillo B., J. D. & Olivar, G., 2011.

## **Prizes**

**Candidato a Investigador Nacional**

Morcillo Bastidas, Jose Daniel (Recipient), 1 Jan 2022

**Distinguished Service Award**

Morcillo Bastidas, Jose Daniel (Recipient), 5 Nov 2021

**IEOM Undergraduate Student Paper Competition Awards**

Morcillo Bastidas, Jose Daniel (Recipient), Navarro, Patricio Alejandro Zamora (Recipient), Miller, Rafael Alejandro Ruiz (Recipient) & Zuazua, Roberto Serna (Recipient), 15 Jun 2023

**Undergraduate Student Paper Competition**

Morcillo Bastidas, Jose Daniel (Recipient), López, Carlos D. (Recipient) & Martínez, Constanza J. (Recipient), 20 Jul 2023