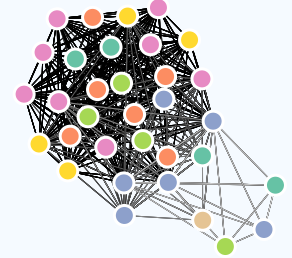


# MARIANA ARBOLEDA

As an educator and researcher, I integrate data science, computational thinking, and equitable education to create meaningful learning experiences. I have led initiatives to help teachers incorporate data literacy and developed data-driven processes to evaluate multiple educational projects. My classroom experience enriches my data analysis work just as much as my involvement in projects enhances the relevance and impact of my teaching.



## EDUCATION

current  
|  
2022

### PhD., Education

Universidad del Norte

📍 Barranquilla, Colombia

- Data Science Education
- Advisor: Camilo Vieira, PhD

June  
2025  
|  
Aug 2024

### Visiting Scholar

University of Virginia

📍 Charlottesville, USA

- Fulbright scholar
- Advisor: Jennifer Chiu, PhD

2022  
|  
2019

### MS Engineering

Universidad EAFIT

📍 Medellín, Colombia

- Applying Machine Learning Models in sales forecasting
- GPA: 4.78/5.0

2016  
|  
2012

### BS Production Engineering

Universidad EAFIT

📍 Medellín, Colombia

- GPA: 4.64/5.0

## INDUSTRY EXPERIENCE

2019  
|  
2017

### Young Professional (Career Development Program)

Ternium Siderúrgica de Caldas

📍 Manizales, Colombia

- Managed an innovative project to monitor on-site construction and maintenance activities using drones
- Designed training courses tailored for new employees enhancing their onboarding experience
- Led regular meetings focused on industrial safety and continuous improvement, fostering a culture of ongoing learning

View this CV online with links at [CV]  
(<https://marianaarboleda.github.io/cv/cv.html>)

## CONTACT



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 [github.com/marianaarboleda](https://github.com/marianaarboleda)

 [marianaarboleda.github.io](https://marianaarboleda.github.io)

 <https://www.linkedin.com/in/marianaarboledaf/>

## LANGUAGE SKILLS

R

Python

Bash

SQL

*Last updated on 2025-02-19.*



## PROJECT AND CONSULTING EXPERIENCE

Present  
|  
2024

### Instructional developer

Charlottesville, VA, USA

📍 University of Virginia

- Designed lesson plans fostering data science with global perspectives.
- Created instructional videos to guide educators in integrating data literacy into their practice.
- Developed assessment tools to measure the effectiveness of instructional materials and track educators' progress.

2024

### Pedagogical coordinator and instructional developer

Barranquilla, Colombia

📍 Universidad del Norte

- Coordinated a team of 5 experts to design 30 lesson plans and evaluations for the K-11 Colombian curriculum
- Designed lesson plans introducing computational science, and data science, and artificial intelligence concepts through unplugged and technology-based activities

2024  
|  
2022

### Research assistant

Barranquilla, Colombia

📍 Universidad del Norte

- Validating psychometric instruments for measuring Teacher well-being and socio-emotional learning of students from two different countries, and leading the report of quantitative results.

2023  
|  
2020

### Leading Data Analyst

Barranquilla, Colombia

📍 Universidad del Norte

- Developed an innovative online visualization platform enabling seamless customization and download of charts, facilitating efficient data-driven analyses for the team.
- Led a team of data analysts to collect, clean, and analyze program data, ensuring data accuracy and integrity for evidence-based decision-making.
- Collaborated closely with other leaders and stakeholders, leveraging data insights to identify areas for improvement.
- Pioneered the implementation of an automated evaluation process for a computational thinking maturity model.

2022

### Curriculum developer assistant

Barranquilla, Colombia

📍 Asociación Colombiana de Facultades de Ingeniería

- Cooperated with senior curriculum developers to enhance the K-12 mathematics curriculum by integrating computational thinking concepts.
- Conducted extensive research to identify opportunities for including computational thinking in the curriculum and aligning it with learning objectives.
- Suggested, revised, and improved a year-by-year learning progression, ensuring a seamless course-by-course progression, which is now published and accessible at Guidelines for the Integration of Computational Thinking in Mathematics.

While my primary focus is in education and research, I have worked across disciplines, from developing computational thinking guides for K-12 to designing data-driven projects that foster critical inquiry. I have led monitoring and evaluation strategies for multiple educational projects, ensuring data quality and availability. My experience spans curriculum design, teacher training, educational technology, and data-informed decision-making.

2020

### Assistant consultant

Medellín, Colombia

📍 Universidad EAFIT

- Worked closely with the client to ensure effective translation of their needs into the tool's features and functionalities
- Created an intuitive user interface using Python's tkinter package for an electrical connections forecasting tool, enhancing user accessibility and usability.
- Built a robust data processing pipeline, streamlining the input data for accurate forecasting and ensuring the tool's reliability.
- Trained the client's in-house team on how to operate the application and interpret the forecasting results, facilitating seamless knowledge transfer and long-term usability.



## TEACHING EXPERIENCE

Dec 2023  
|  
Jan 2023

### Mathematics Tutoring

Universidad del Norte - I.E El Cañahuate

📍 Barranquilla, Colombia

- Providing tailored mathematics tutoring sessions to high school students, with a strong emphasis on statistics, probability, and data visualization
- Instilling an appreciation for Mathematics and its practical applications, with a focus on real-world examples and relevance
- Utilizing various teaching resources to enhance comprehension of statistical concepts and data representation while recognizing the environmental limitations

Dec 2023  
|  
Jul 2022

### Computational Thinking for Everyone

Universidad del Norte

📍 Barranquilla, Colombia

- Teaching Computational Thinking, Data Science, and Machine Learning fundamentals for multidisciplinary students
- Implementing a design-based research approach to refine the program using evidence from the initial offerings

Nov 2021  
|  
Apr 2021

### Computational Thinking for High School Level Students - Remote Learning

Universidad EAFIT

📍 Medellín, Colombia

- Engaged students in beginner-friendly activities fostering the development of computational thinking skills
- Encouraged collaborative learning through online platforms, creating an interactive and inclusive virtual classroom

Dec 2016  
|  
Jan 2014

### English as Second Language for Children and Adolescents

Universidad EAFIT

📍 Medellín, Colombia

- Participated in ongoing pedagogical training programs, continuously enhancing teaching techniques
- Designed and implemented engaging, age-appropriate curriculum

I am passionate about making computational thinking and data science accessible to all learners. I believe that engaging, context-rich learning experiences can empower students to see themselves as creators and problem solvers. My approach centers on interactive pedagogy, inclusive practices, and real-world applications, with a strong emphasis on data literacy and its role in education.



## AWARDS, FELLOWSHIPS, & GRANTS

2025  
|  
2024

### **Fulbright scholarship - Estudiante doctoral colombiano**

Fulbright Colombia

📍 Colombia

- Awarded for academic excellence and leadership potential, as part of a highly competitive selection process supporting Colombian doctoral students in international research and study.

2022  
|  
2019

### **Full-Funded Research Project in Engineering**

Universidad EAFIT

📍 Colombia

- Awarded to fully support my master's degree in engineering, recognizing the quality and impact of my research proposal.

2016  
|  
2012

### **Bachilleres por Colombia Scholarship**

Ecopetrol

📍 Colombia

- Full scholarship for the entire undergraduate program

2015

### **Roberto Rocca Education Program Scholarship**

Ternium, Techint Ingeniería y Construcción and TenarisTamsa

📍 Colombia

- Awarded based on academic performance and a rigorous selection process

2014

### **Jóvenes ingenieros del DAAD 2014-2015. Precandidate**

Universidad EAFIT

📍 Colombia

- Language scholarship based on academic merit

2014

### **Honorary scholarship for academic performance**

Universidad EAFIT

📍 Colombia

- Awarded for achieving the highest average score in my engineering program.



## SELECTED PUBLICATIONS, POSTERS, AND TALKS

2023

### **Opening the Machine Learning Black Box for Multidisciplinary Students: Scaffolding from GUI to Coding**

2023 IEEE Frontiers in Education Conference (FIE) 📍 College Station, TX, USA

- Arboleda, M., Vieira, C., & Chiu, J. L.
- Opening the Machine Learning Black Box for Multidisciplinary Students: Scaffolding from GUI to Coding
- DOI: <https://doi.org/10.1109/FIE58773.2023.10343043><sup>1</sup>

## Interpreting Direct Sales' Demand Forecasts Using SHAP Values

Production



2023

- Arboleda-Florez, M., & Castro-Zuluaga, C.
- Interpreting direct sales' demand forecasts using SHAP values
- DOI: <https://doi.org/10.1590/0103-6513.20220035><sup>2</sup>

2021

## Introduction Chapter

In Influencing Customer Demand: An Operations Management Approach

CRC Press

- Castro-Zuluaga, C., & Arboleda-Florez, M.
- Introduction to the book 'Influencing Customer Demand: An Operations Management Approach'
- DOI: <https://www.routledge.com/Influencing-Customer-Demand-An-Operations-Management-Approach/Hemmati-Sajadieh/p/book/9780367619985><sup>3</sup>

2021

## Sales Forecasting Difficulties' Analysis on Colombian Direct Sales Companies

In Proceedings of the International Congress of Industrial Engineering (ICIE2019)

Springer International Publishing

- Castro-Zuluaga, C. A., & Arboleda, M.
- Sales Forecasting Difficulties' Analysis on Colombian Direct Sales Companies
- DOI: [https://doi.org/10.1007/978-3-030-49370-7\\_12](https://doi.org/10.1007/978-3-030-49370-7_12)<sup>4</sup>



## OUTREACH

Oct 2024

### Integrating Data Science in the classroom: Research experiences

Cátedra Europa 2024U - niversidad del Norte

Barranquilla, Colombia

Panelist

June  
2024

### AI: Enemy or Ally?

Deeper Learning LATAM 2024

Medellín, Colombia

Workshop Facilitator

2023

### Master class: Applied Computational Thinking in Education

Institucion Universitaria Americana

Barranquilla, Colombia

Panelist

2023	<b>Navigating the World of Data. VII Technology Forum: “Innovation for Life. New Educational Technologies for the Integration of Society”</b> Colegio Biffi la Salle <div> <span>📍</span> Barranquilla, Colombia         </div> Panelist
2023	<b>Data for Change: How Can Young People Contribute to the SDGs Using Data Science. “Innovation and Sustainability Forum: A Youthful Perspective on the SDGs”</b> Barranquilla Territorio STEM <div> <span>📍</span> Barranquilla, Colombia         </div> Panelist
2022	<b>Public Policy Dialogue CFK. Computational Thinking: The Future is Now</b> British Council Colombia <div> <span>📍</span> Bogotá, Colombia         </div> Panelist
2021	<b>Computational Thinking in School</b> Universidad EAFIT <div> <span>📍</span> Medellín, Colombia         </div> Workshop Facilitator
2019	<b>Student Research Groups Fair</b> Universidad EAFIT <div> <span>📍</span> Medellín, Colombia         </div> Volunteer Judge

## LINKS

- 1: <https://doi.org/10.1109/FIE58773.2023.10343043>
- 2: <https://doi.org/10.1590/0103-6513.20220035>
- 3: <https://www.routledge.com/Influencing-Customer-Demand-An-Operations-Management-Approach/Hemmati-Sajadieh/p/book/9780367619985>
- 4: [https://doi.org/10.1007/978-3-030-49370-7\\_12](https://doi.org/10.1007/978-3-030-49370-7_12)