

Maria Oros Barron

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Professional Summary

I am a data scientist at the Data Science Institute at the University of Wisconsin-Madison. My research interests encompass the bayesian statistical methods and machine learning applications. My current work focuses on hybrid modeling applications where data is scarce or difficult to obtain.

Education

University of Wisconsin-Madison, Data Scientist Profile	June 2023
University of Navarra-DATAI, Data Science, Certification of professional competence	June 2022
• Focus Areas: Supervised Machine Learning	
University of Guanajuato-CIMAT, Mathematics	Aug 2018
• Thesis: Hamiltonian Systems (mathematical physics topics), under the supervision of Carlos Valero Valdez Ph.D and Rafael Herrera Guzman Ph.D	
• Relevant Coursework: Stochastic Processes, Stats Inference, Mathematical Analysis, Topology, Markov Chains	

Publications

** Denotes first co-author contribution

1. Determining the Optimal Timing and Economic Return of Corn Fungicide Applications Using a Network Meta-Analysis <i>Phytofrontiers</i> DOI: 10.1094/PHYTOFR-08-25-0079-R	July 2025
Kiersten Wise, Ph.D., Maria Oros **, Professor Damon Smith, Ph.D.	
2. Meta-Analytic and Economic Evaluation of Fungicide Programs Applied for Managing Sclerotinia Stem Rot in Soybean Across the North-Central United States <i>Phytofrontiers</i> DOI: 10.1094/PHYTOFR-07-25-0068-R	July 2025
Hope Reinforest, Ph.D., Maria Oros **, Professor Damon Smith, Ph.D.	
3. Quantifying the Agronomic Benefits of Fungicide Use in Alfalfa: A Meta-Analysis Peer-review Maria Oros **, Shalini Yerukala, Ph.D., Professor Damon Smith, Ph.D.	July 2025
4. Math Olympiads Textbook Book Link	Aug 2018
5. Hamiltonian Systems and Applications Thesis to major in mathematics.	Aug 2018

Professional Experience

Staff Data Scientist (Research Assistant) (Supervisor: Kyle Cranmer, Ph.D.) Data Science Institute, University of Wisconsin-Madison	June 2023 – Present
• Self Supervised Learning techniques for anomaly detection, with Professor Maja Rudolph, Ph.D.	
• Statistical analysis, time series modeling, and Kalman filtering to characterize soil organic carbon, with Professor Jingyi Huang, Ph.D.	
• Characterization of monoclonal antibody dynamics with the transport dispersive model and moellerup isotherm, thermodynamics principles - Boehringer Ingelheim.	
• Open source survey results site DOI: https://doi.org/10.5281/zenodo.17379408	
• Meta-analysis and hybrid modeling approaches to characterize cost-benefit treatment applications in soybean, corn, and alfalfa crops, resulting in scientific publications and release of dynamic ROI tools for farmers published in the Crop Protection Network, Professor Damon Smith Ph.D	

- Development of LLM-powered applications for anomaly detection, in collaboration with industry partner SafeSet
- Senior Data Scientist** (*Supervisor: Marcel Stockly Contreras, CEO*) Sept 2022 – June 2023
Bisonic Inc. – Remote, CA
- **Game Economy Design** of [Forgotten Runiverse MMORPG](#): Developed key performance indicators for the in-game crafting system to support strategic decision-making processes
 - **NFT Rarity Scoring**: Led the development of a statistical framework to quantify Non-Fungible Token (NFT) rarity, culminating in an interactive dashboard built with Streamlit
- Senior Data Scientist** (*Supervisor: Ivan Solorzano, MSc.*) March 2021 – Sept 2022
BBVA Mexico – Mexico City
- **Credit Risk Statistical Modeling**: Developed and maintained statistical models underlying core credit card lending operations, including ML techniques for customer segmentation. Achieved 15% performance improvement over previous models. Increase the credit portfolio 8% *Technologies: PySpark, R, SAS*
 - **Customer Attrition Analysis**: Finalist (Top 3) in BBVA Mexico internal modeling competition. Developed a custom clustering model (KNN) to identify customers with highest attrition probability, delivering a comprehensive workflow and dynamic visualization tool for stakeholder use. *Technologies: PySpark, GCP*
- Data Scientist** (*Supervisor: Dulce Ambrocio and Fatima Herrera*) Feb 2019 – Feb 2021
True Home – Mexico City
- **Automated Real Estate Valuation**: Developed and deployed a machine learning-based pricing model to estimate property values across Mexico City and metropolitan areas, served through AWS API infrastructure. *Technologies: Python, PostgreSQL, AWS, SQL, GeoPandas*
 - **Strategic Analytics Consulting**: Provided statistical consulting services to inform property acquisition decisions and business expansion strategies throughout Mexico

Teaching

- Research Assistant** Aug 2015 – Aug 2018
CIMAT (Center for Research in Mathematics) and University of Guanajuato
- **Supervisors:** Carlos Valero Valdez, Ph.D. and Rafael Herrera Guzmán, Ph.D.
 - Investigated the mathematical properties of differential forms and characterized Hamiltonian systems, including their relationships to Mechanical and Lagrangian Dynamical Systems
 - Explored theoretical applications in optics and mathematical physics
- Teacher Assistant** Aug 2012 – Aug 2015
University of Guanajuato
- Probability and Statistics (Chemistry Department)
 - Advanced Topics of Mathematical Physics (Mathematics Department)
 - Mathematical Olympiads for K12-K15, University of Guanajuato
- Mathematics and Physics Instructor** June 2011 – Feb 2019
Independent Contractor
- Provided online tutoring services through Superprof platform, covering advanced mathematics and physics topics including Markov chain theory, classical mechanics, and calculus. Successfully taught students internationally.
 - Delivered on-demand educational services, leveraging expertise gained through university-level science communication work

Conference Presentations and Workshops

- Midwest Machine Learning Symposium**, University of Chicago, IL June 2025
Poster Presentation: Meta-analytical application and Open Source Tools in Agriculture [Link](#)
- Data Science Institute Internal Reading Group**, at UW-Madison May 2025
Invited Talk: Can LLMs be anomaly detectors?

Research Bazaar , UW–Madison	Feb 2025
<i>Lightning Talk</i> : An open-source crop disease forecasting tool Link	
El Zoominario at the Plant Pathology Department , UW–Madison	Sept 2024
<i>Invited Talk</i> : The Data Science Institute Services	
Research Bazaar , UW–Madison	Feb 2024
<i>Poster Presentation</i> : Meta-analytic and economic approaches in corn research	
Data Science Institute Internal Reading Group , at UW–Madison	Dec 2023
<i>Invited Talk</i> : The Metropolis Hasting Algorithm	
Aquelarre Matemático , Autonomous National University of Mexico (UNAM), Mexico City	Oct 2018
<i>Invited Talk</i> : Advanced topics in mathematical physics Link	

Leadership and Service

Organizational Committee Member	Jan 2015 – June 2018
National Elementary and Middle School Mathematical Olympiad Program (ONMAPS)	
Served on the organizational committee for the National Elementary and Middle School Mathematical Olympiad Program (ONMAPS) in Guanajuato state. Responsibilities included designing, administering, and evaluating selection examinations; training selected students; and conducting professional development workshops for educators across multiple school districts.	
Science Education Volunteer	Jan 2012 – Dec 2014
Educational Extension Department, CIMAT	
Volunteered with the Mathematics Educational Extension department (Matemorfosis) at CIMAT. Designed and delivered interactive mathematics workshops for K-12 students throughout Guanajuato state, promoting mathematical literacy and scientific engagement among young learners and their parents.	

Technical Skills

Programming Languages : Python, R, SAS, SQL, HTML/CSS
Tech Stack : Docker, GitHub, Flask
Cloud Platforms : Amazon Web Services (AWS), Google Cloud Platform (GCP)
Miscellaneous : Shell, LATEX, MS Office, Postgres SQL, HPC
Visualization : R shiny, Streamlit, AWS QuickSight, Tableau

Certifications

Duolingo English Test Score , English Link	Sept 2025
TOEFL Reading and Listening Sections Skills Mastery	Feb 2025
English proficiency Link	
University of Illinois , Microeconomics Principles Specialization	Feb 2025
Computational and Graphical Models in Probability , IBM	Feb 2025
Understand and apply probabilistic graphical models, including Bayesian networks, to reason about uncertainty and infer relationships in data. Link	
Statistical Inference , Johns Hopkins University	Feb 2025
Hypothesis Testing Link	
Data Science: Inference and Modeling , Harvard University	July 2021
Hypothesis Testing Link	