Randley Morales, Ph.D.

Mathematician & Machine Learning Specialist |
Generative AI, Computer Vision & Predictive Modeling

+1 (805) 946-8257
randley@gmail.com
www.randleymorales.com

PROFESSIONAL SUMMARY

Mathematician and AI Engineer with 10+ years of experience transforming advanced mathematical theory into production-grade machine learning systems. I specialized in Generative AI, Computer Vision, and predictive modeling, with hands-on expertise building end-to-end ML pipelines — from research and feature engineering to API deployment and cloud-ready applications.

Strong background in Differential Geometry and Numerical Linear Algebra enables deep understanding of model behavior, optimization, and high-dimensional data structures. Proven ability to design scalable RAG architectures, deep learning models, and ensemble systems that deliver measurable business impact.

Combines research rigor, full-stack development experience, and applied machine learning to solve complex engineering and data-driven challenges.

EDUCATION

Post Graduate Program in AI & Machine Learning: Business Applications | The University of Texas at Austin – McCombs School of Business (May 2025 – Feb 2026)

Ph.D in Mathematics | Universidad Central de Venezuela (2009)
- **Dissertation:** "*Path Splines with Conic Envelopes*".

M.S. in Mathematics | Universidad Central de Venezuela (2003)
- **Dissertation:** "*Geometric Modeling Families 2D and 3D Lemniscates*".

B.S. in Mathematics | Universidad Central de Venezuela (2000)
- **Dissertation:** "*Construction of Polynomial Bezier Splines Continuous Curvature G2*".

PROFESSIONAL EXPERIENCE

MATEMATIKAS XYZ

Oxnard, CA | May 2020 - Present

Mathematical Visualization Specialist & Technical Developer

- Engineered algorithmic visualizations to demonstrate complex geometric theorems, utilizing mathematical software to bridge the gap between abstract theory and visual representation.
- Applied geometric modeling principles to render high-fidelity 2D/3D forms (surfaces, curves, and topologies), leveraging research in path splines to ensure mathematical accuracy.
- Optimized production pipelines for technical educational content, managing the end-to-end workflow to deliver high-precision graphics under strict timeline constraints.

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CALIFORNIA STATE UNIVERSITY, CHANNEL ISLANDS

Camarillo, CA | JAN 2020 - MAY 2020

Mathematics Teaching Associate

- Delivered academic instruction in mathematics, managing classroom lectures and laboratory sessions.
- Evaluated student performance through the administration of examinations and rigorous grading of course materials.

SAN NUTRITION CORP

Oxnard, CA | Aug 2015 – Apr 2020

Senior Web Developer & Technical Designer

- Architected and deployed full-stack web solutions, managing the complete software development lifecycle from initial system design to testing and maintenance.
- Engineered custom e-commerce applications, writing robust code for high-traffic web platforms and overseeing rigorous testing protocols.
- Integrated high-fidelity 2D/3D visual assets into digital products, optimizing graphics rendering for web performance and user impact.

UNIVERSIDAD CENTRAL DE VENEZUELA

Caracas, VE| Oct 2000 – Jun 2012

Mathematics Professor & Researcher

- Directed research initiatives in Applied Geometry and its application to Computer Graphics, bridging theoretical mathematics with computational visual fields.
- Lectured on advanced topics including Differential Geometry, Numerical Linear Algebra, and Topology at both undergraduate and graduate levels.

TECHNICAL SKILLS

- **Generative AI & LLM Stack:** RAG Architectures, LangChain, Semantic Search, Vector Databases (Pinecone, ChromaDB), Prompt Engineering, OpenAI API, Hugging Face Transformers.
- **Deep Learning & Computer Vision:** CNNs (ResNet, VGG16, EfficientNet), Object Detection (YOLO), Image Segmentation, Transfer Learning, OpenCV, Geometric Deep Learning.
- **Machine Learning & Data Science:** XGBoost, Random Forests, Gradient Boosting, PCA, K-Means Clustering, Hyperparameter Tuning (GridSearch/Optuna), A/B Testing.
- **Mathematical Expertise:** Differential Geometry, Computational Geometry, Numerical Linear Algebra, Topology, Differential Equations, Probability Theory, Statistics.
- **Programming & MLOps:** Python (Pandas, NumPy, Scikit-learn), PyTorch, TensorFlow/Keras, SQL, Docker, Flask, Streamlit, Git, LaTeX, MATLAB, MapleSoft.

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AI & MACHINE LEARNING PROJECTS

SUPERKART

End-to-End Sales Forecasting Engine

Stack: XGBoost, Docker, Flask, Streamlit, Hugging Face

• Engineered a full-stack predictive modeling system to forecast quarterly revenue, utilizing rigorous EDA and hyperparameter tuning to optimize model performance.

• Operationalized the solution by containerizing the model with Docker and exposing endpoints via Flask, deploying a live interactive dashboard for real-time stakeholder decision-making.

HELMNET

Computer Vision for Industrial Safety

Stack: Python, TensorFlow/Keras, OpenCV, CNNs, Data Augmentation

• Designed a custom Convolutional Neural Network (CNN) to automate safety helmet detection in high-risk environments, implementing advanced data augmentation (geometric transformations) to handle diverse lighting conditions.

• Achieved 98.5% accuracy on the test set, creating a scalable automated monitoring tool that significantly reduces manual compliance oversight.

MEDICAL ASSISTANT

Generative AI & RAG Pipeline

Stack: Python, LangChain, OpenAI GPT-4, Pinecone (Vector DB), Semantic Search

Architected a Retrieval-Augmented Generation (RAG) system to synthesize complex medical data, engineering vector embeddings to enable high-precision semantic search across unstructured text.

• Reduced information retrieval time by 40%, delivering accurate, context-aware responses to user queries while strictly adhering to domain-specific constraints.

RENEWIND

Predictive Maintenance for Renewable Energy

Stack: Deep Learning (ANN), SMOTE, Scikit-learn, Python

• Developed a binary classification model to predict wind turbine component failures, utilizing SMOTE techniques to resolve significant class imbalances in sensor data.

• Optimized for Recall to minimize false negatives, successfully identifying 90% of potential failures proactively and reducing projected maintenance downtime.

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CERTIFICATIONS & PROFESSIONAL DEVELOPMENT

- **Pandas Analytics** | ***Coddy Team*** (Dec 2025)
- **SQL for Advanced** | ***Coddy Team*** (Dec 2025)
- **Learn to Code with AI** | ***Scrimba*** (Dec 2025)
- **Learn RAG** | ***Scrimba*** (Dec 2025)
- **Ethics of AI** | ***Great Learning*** (Oct 2025)
- **Introduction to AI Agents** | ***Great Learning*** (Sep 2025)
- **Python Foundations** | ***Great Learning*** (Jul 2025)

References Available Upon Request

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