# Ronald David Martinez Marenco

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Barranquilla, Colombia

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## Summary

Software Engineering Student (3rd year) passionate about the tech world, artificial intelligence, and eventually becoming an innovator. With experience in Python, Machine Learning, and backend development through academic and personal projects. Developed AI-driven prototypes inciuding chatbots and computer vision systems using YOLO and Tensorflow. Familiar with building REST APIs using FastAPI, and creating basic web interfaces with JavaScript, HTML, CSS, and React. Strong academic background and focused on growing skills in applied AI and data-driven systems.

## Projects

**Data Viento: Weather Climate Insights Platform** - DataViento Webpage        *October 2025 - Present*

Python, FastAPI, JavaScript, HTML, CSS, MySQL, Docker, OpenMeteo API, Cron Automation, Gemini LLM

- Developed a full-stack web application that collects, stores, and visualizes climate data from the OpenMeteo API, providing interactive dashboards and AI-assisted explanations based on the user's selected city.
- Built backend services using FastAPI to consume weather data from the OpenMeteo API and store structures time-series data in MySQL, ensuring efficient retrieval and analysis.
- Implemented frontend intercafe with HTML, CSS,JavaScript and chart.js library to render a dashboard that displays weather variables and trend charts based on the user's selected city.
- Developed an Gemini LLM-powered chatbot to explain weather variables, chart interpretations, and climate impacts applying prompt engineering to improve contextual responses.
- Automated data ingestion via Python Scripts and Linux cron jobs, updating database on a schedule without manual intervention.
- Docker environment for containerized deployment and Git version control to manage the full project lifecycle collaboratively.

**Hunting Exoplanets NASA-Hackathon** - Hunting Exoplanet Webpage        *October 2025*

Python, Tensorflow, Google Colab, Streamlit.

- Developed a predictive web application for exoplanet classification, allowing users to input planetary features or upload CSV files for batch prediction using an interactive Streamlit interface.
- Cleaned and preprocessed astronomical datasets in Google Colab, handling missing values using median imputation and performing correlation analysis to understand feature relationships.
- Built and evaluated multiple ensemble machine learning models (Voting Classifier combining RandomForest, LGBM, XGBoost) within a TensorFlow-compatible architecture to ensure robust prediction performance.
- Achieved approximately 87% accuracy on the trained dataset.

**Educational AI Chatbot with RAG and Voice Interface** - Github Repository        *April 2025 - June 2025*

Java, Spring Boot, Spring AI, MySQL, HTML, Tailwind CSS, JavaScript, Gemini (Vertex AI), ElevenLabs, Jina AI Embeddings

- Developed an educational chatbot backend using Spring Boot and Spring AI, supporting conversational memory and intent-aware responses.
- Integrated generative responses via Gemini (Vertex AI) and added text-to-speech (TTS) functionality using ElevenLabs for voice interaction.
- Implemented Retrieval-Augmented Generation (RAG) by extracting text from educational documents using Apache Tika and generating embeddings with Jina AI, enabling document-based question answering.
- Built a lightweight frontend with Tailwind CSS and persisted conversation and metadata in a MySQL database.

**Colombian License Recognition** - Github Repository                    *January 2025 - February 2025*

Python, YOLOv11n, OpenCV, EasyOCR, Computer Vision, CSV Data Pipelines

- Developed a real-time license plate recognition system for Colombian plates using YOLOv11n to detect plates from images,videos, and live camera streams.
- Integrated EasyOCR to extract license plate text as structured strings after image preprocessing.
- Built an image processing pipeline with OpenCV, applying grayscale conversion, normalization, and standardization to improve OCR accuracy.
- Designed a real-time data pipeline to capture detected plates, handle missing values, and append results dynamically to a CSV file.
- Achieved approximately 98% accuracy on the trained dataset through iterative training and evaluation.

**Fundacion Remedios de Manases Webpage (Freelance Work)** - Landing Page                    *November 2024*

React, JavaScript, HTML, CSS (Responsive Design)

- Developed a responsive and dynamic website based on client requirements for clarity, accessibility, and lightweight design.
- Implemented dynamic UI behavior using plain CSS, applying subtle hover transitions (scale and rotation effects) to enhance interactivity without overloading the interface.
- Aligned the interface with the foundation's branding, ensuring consistency with logo, colors, and typography.
- Designed a fully responsive layout, ensuring readability and usability across desktop and mobile devices through custom CSS breakpoints.

**Sign Language Recognition App Using Machine Learning** - Scientific article                    *March 2024 - Present*

Python, Tensorflow, Keras, Mediapipe Holistic, OpenCV, Numpy, LSTM / CNN Neural Networks

- Developed a sign language recognition application using computer vision and deep learning to classify 10 Colombian sign gestures.
- Created a custom dataset by recording and labeling sign language samples, then expanded it using image and sequence augmentation techniques.
- Extracted pose, hand, and facial landmarks with MediaPipe Holistic and standardized input data before model training.
- Trained an LSTM-based neural network using TensorFlow and Keras to model temporal gesture sequences.
- Achieved approximately 95% classification accuracy on the trained gesture set through iterative training and evaluation.

## Education

**B.Sc. in Systems Engineering** from Universidad Simon Bolivar, Colombia                    *In Progress - 5th Semester*

- 1st Place in GPA - Systems Engineering Program
  GPA: 4.86 / 5.0
- Active member of the Data Science research group.
- Student representative for the systems engineering program.

## Honor & Awards

- **NASA Space Apps Challenge - Global Nominee**
  **Project**: Hunting Exoplanets - Developed an AI-based solution for detection of exoplanets using Python, Tensorflow, Pandas, Streamlit.
- **Elite Researcher Recognition**
  Awarded for academic research excellence.
- **RedColsi Speaker at international conference**
  Speaker for **Sign Language Recognition App Using Machine Learning**

## Skills

- **Languages:** Python, JavaScript, SQL.
- **Web:** HTML, CSS, React.
- **Backend:** FastAPI, Flask.
- **AI/Machine Learning:** Tensorflow, YOLO, NumPy, Pandas.
- **Technologies:** MySQL, Docker, Git, Github.