ALBERTO ESPINOSA DE LOS MONTEROS

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WORK EXPERIENCE

Lead Developer   **08/2024 - Present**
Global Healthcare Exchange (GHX)   **Louisville, CO**

- Lead a 7-member interdisciplinary team to build a hybrid AI system combining Prolog rule-based logic with LLMs, improving medical product matching accuracy by 30% and saving 25+ hours/week in manual review.
- Design and maintain Python-based APIs integrating SQL databases, Prolog inference engines, and OpenAI models for real-time, scalable data processing.
- Enhance LLM performance through prompt engineering and string differentiation algorithms; maintain 95%+ PyTest coverage of critical components and reduce response mismatches by 40% with structured logging and observability tools.
- Engineer and deploy a containerized system on AWS EC2 leveraging Docker and automated CI/CD pipelines, with a focus on secure access control, performance optimization, and modular architecture for maximum reusability.

RELEVANT PROJECTS

AWS DeepRacer Competition

- Built a custom autonomous vehicle using Raspberry Pi, LiDAR, ROS2 and camera modules on Linux, achieving enhanced edge-compute autonomy.
- Improved localization by 80% using EKF and optical flow; implemented PID and MPC controllers to cut trajectory deviation by 60% and boost lap stability.

Disaster Relief Prediction Platform

- Built ML models (Random Forest, SVM, Gradient Boosting) to predict disaster severity with up to 69% accuracy.
- Developed an end-to-end ETL pipeline with imputation, feature engineering, and class balancing; led model evaluation and comparative analysis across disaster types for resource allocation.

Hackathon – AI-Powered Summarizer

- Built a full-stack AI note-taking app in 24 hours at HackCU11 using Flask, OpenAI Whisper (for real-time transcription), and GPT-4 (for summarization), achieving 95%+ accuracy on lecture audio.
- Engineered a backend pipeline to process 25MB+ audio/video files in under 10 seconds for automated summarization.

Reliable UDP File Transfer Protocol

- Engineered a high-performance UDP client-server system simulating FTP with multi-threading, retransmissions, and windowing; enabled 100MB+ file transfers with 99% data integrity and 20% faster speeds under high-load conditions.

EDUCATION

University of Colorado Boulder, College of Engineering and Applied Sciences   **08/2020 - 05/2025**
Bachelors in Computer Science with Minors in Business & Computer Engineering

LEADERSHIP

Leadership & Involvement: Division 1 Rugby Player, Course Assistant (CS Dept), Volunteer at Timberline Adult Day Care, BOLD Scholar, SHPE Member, Youth Football Coach
Awards: Dean's List (5+ semesters), BOLD & Summit Foundation Scholarships, Three Peak & Ted Sizer Awards

TECHNICAL SKILLS

Python, SQL, Rest APIs, Flask, Docker, Kubernetes, AWS EC2, Agile, Object-Oriented, Multi-threading