

Josue Valenzuela Perez

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Computer Systems Engineering student pursuing ML internship. Hands-on experience in artificial intelligence, computer vision, data engineering and optimization through research and applied ML projects. Currently student at Universidad de Guanajuato with completed exchange program at Chalmers University.

Education

Universidad de Guanajuato

Bachelor's in Computer Systems Engineering. GPA 9.8
Relevant Coursework: High honors two consecutive years.

Salamanca, GTO
Aug 2022 – Dec 2026 (Expected)

Chalmers University of Technology

Study abroad coursework in Data Science and AI.
Courses: Design of AI Systems, Discrete Optimization,
Applied Machine Learning, Computational techniques for large-scale data.

Gothenburg, Sweden
January 2026 – June 2026

Experience

Universidad de Guanajuato

Student Research Assistant (Social Service)

Salamanca, GTO
October 2025 – May 2026

- Developing robust heart rate estimation system processing real-time video streams and delivering physiological metrics within 10 seconds for clinical validation.
- Implemented Mediapipe Hands framework for hand ROI detection and skin mask extraction achieving 90% accuracy across diverse lighting conditions.
- Engineered signal processing using band pass filters and FFT to extract heart rate signals, validated within 48-180 BPM range.
- Applied experimentation workflow using Git for version control and automated testing scripts, ensuring reproducibility across 50+ validation runs.

Projects

Sentinel CV | PyTorch, YOLOv8, FastAPI, React, Docker

- Won 1st Place in the Hola Mundo 2026 National Innovation Competition, organized Seguridad Privada OKIP S.A. de C.V and Tenaxes., by developing a production-ready AI-powered video analytics platform for intelligent surveillance.
- Built a scalable multi-model computer vision pipeline combining YOLOv8 object detection, pose estimation, and a custom fine-tuned weapon detector, supporting 12 concurrent video streams with 872 ms end-to-end latency.
- Curated a 14K-image weapon detection dataset and fine-tuned YOLOv8, achieving 0.770 mAP@50 while implementing weapon detection, intrusion, loitering, fall detection, abandoned object, and virtual line-crossing analytics.
- Developed the complete deployment stack using FastAPI, React, Redis, PostgreSQL/TimescaleDB, Docker Compose, WebSockets, and CUDA, enabling configurable edge inference, live alerts, and historical event analytics.

Deepfake Detection with Vision Transformers | PyTorch, timm, OpenCV

- Built a deepfake detection pipeline on FaceForensics++ (7K videos, 6 manipulation methods) using official splits (720/140/140) with fine-tuned ViT-B/16 (ImageNet pre-trained), benchmarked against Xception and EfficientNet-B4.
- Achieved test AUC of 0.972, competitive with Xception (0.978) and outperforming EfficientNet-B4 (0.967), with peak AUC of 0.996 on DeepFakeDetection.
- Demonstrated improved robustness to blur perturbations (AUC 0.874 @ K=7 vs 0.821 / 0.781) and stable performance under JPEG compression (Q=25–75).
- Evaluated cross-dataset generalization on Celeb-DF v2 (AUC 0.810) and implemented attention visualization (CLS, rollout, saliency) revealing method-specific artifacts.

Surgical Nursing RAG CLI | LangChain, Ollama, ChromaDB

- Built a fully local retrieval-augmented generation system indexing 1,557 pages of medical literature into 8,210 embeddings.
- Optimized ChromaDB vector database indexing with semantic chunking, achieving <250ms retrieval latency and L2 distance of 0.45 on similarity search.
- Implemented production-grade offline inference pipeline using quantized LLMs (Llama 2/Nomic), eliminating cloud API costs and enabling edge deployment.
- Applied software engineering best practices including Git for version control, modular code design, and testing.

Skills & Interests

Programming: Python, C++, C, JavaScript.

ML/AI Frameworks: PyTorch, TensorFlow, Keras, Scikit-learn, OpenCV, LangChain, ChromaDB, Ollama.

Data: Pandas, NumPy (data cleaning, preprocessing, feature engineering), SQL.

Optimization: CVXPY, Gurobi.

Tools: Git, Jupyter, VS Code.

Languages: English (Advanced - TOEFL 590), Spanish (Native).