Cesar Alan Torres

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About Me

Machine Learning and AI Researcher with an academic background in Soft Computing and Computer Vision. Passionate about Linux, self-hosting, and implementing SOTA models tailored to edge devices.

Experience

Thermo Fisher Scientific Nov 2024 – Present
Software Developer II Tijuana, Mexico

- Designed and developed GeneAI.
- Integrate LLMs including GPT, Claude, and various open-source LLMs within a secure, private deployment environment.
- Built internal infrastructure for managing embeddings, routing logic, and response generation.
- Enabled dynamic AI agent creation to support organization-wide automation and task handling.
- Contributed to a fully customizable, ChatGPT-style interface with complete control over UX and model governance.

Samsung Research Tijuana Feb 2023 – Nov 2024
Machine Learning Engineer Tijuana, Mexico

- Adapted SOTA models to develop proof-of-concept systems.
- Built internal tools for data annotation and analysis.
- Implemented real-time CV models (Face Recognition, Action Recognition).
- Deployed LLMs/VLMs optimized for edge devices.

Sistemas Audiovisuales Tijuana Jul 2011 – Jan 2021
Audio and Illumination Technician Tijuana, Mexico

- Operated and maintained audio, video, and lighting systems for a wide range of live events and conferences.
- Handled stage setup, technical logistics, and on-site troubleshooting to ensure smooth event execution.
- Oversaw end-to-end event production, including equipment configuration and coordination with performers or speakers.
- Contributed across multiple roles as part of a family-run business, including client communication, planning, and general operations.

Education

ScD. in Computer Science 2024 – 2028
Instituto Tecnológico de Tijuana Focus: Generative AI, LLMs, Multimodal Learning
MSc. in Computer Science 2021 – 2023
Instituto Tecnológico de Tijuana Thesis: Deep Fuzzy Neural Learning Models
BSc. in Computer Science Engineering 2015 – 2019
Cetys Universidad Tijuana Cum Laude, Specialization in Computer Vision

Skills

- **Programming:** Python, C++, C, Java, JavaScript, MATLAB
- **ML Frameworks:** PyTorch, TensorFlow, Scikit-learn, Keras
- **Data Science:** NumPy, Pandas, SciPy, XGBoost, Matplotlib
- **Web:** HTML, CSS, React, Angular
- **Tools:** Git, Docker, Hugging Face, RoboFlow, Jira
- **Operating Systems:** Linux (Debian, Ubuntu, Arch), Windows, macOS
- **Cloud:** AWS (EC2, Lambda, S3), GCP (Compute Engine, SQL DBs)
- **Self-Hosting Services:** Pi-hole, NextCloud, Game Servers, Samba, Nginx, Wireguard

Languages

Spanish (Native), English (Advanced C1), German (Basic)

Awards

- 1st Place: AI Hackathon by AiLabSchool, 2022 (Microsoft-sponsored)
- 127th Place: IBM Behind the Code Marathon, 2020 (50,000+ participants)
- Outstanding Project: Engineering Project Fair, Cetys Universidad, 2019

Selected Publications

- Fuzzy Edge Detection as a Preprocessing Layer in Deep Neural Networks for Guitar Classification. *Sensors*, 2022. doi:10.3390/s22155892
- Traffic Sign Recognition Using Fuzzy Preprocessing and Deep Neural Networks. *Springer SCI*, 2023. doi:10.1007/978-3-031-28999-6_5
- Fuzzy CNN Model Applied to Classification Problems. *J. of Intelligent & Fuzzy Systems*, 2024. doi:10.3233/JIFS-219369
- Torres, C., Gonzalez, C.I. (2025). *Automated Insights: LLMs in Neurodegenerative Disease Research and Comparison.* In: Martínez-Villaseñor, L., et al. *Advances in Computational Intelligence. MICAI 2024 International Workshops.* Lecture Notes in Computer Science, vol 15464. Springer, Cham. doi:10.1007/978-3-031-83879-8_9
- Torres, C., Gonzalez, C.I., Garcia, M., & Merelo-Guervos, J. (2025). *Efficient Domain-Specific LLMs: Energy Profiling in Medical QA Tasks.* Accepted for presentation and publication at IJCNN 2025, Rome, Italy.

Selected Presentations

- Deep Neural Network Approach for Guitar Type Classification in Real Time. VII Congreso Internacional de Investigación, UABC, Apr 2022.
- Fuzzy Convolutional Layer in Deep Neural Networks for Feature Extraction. ISCI 2022, TecNM, Aug 2022.
- Type-2 Fuzzy Image Enhancement to Improve the Performance of Convolutional Neural Networks. ISCMI 2023, CDMX.
- Fuzzy Convolutional Neural Network Model Applied to Classification Problems. CCAIS 2023.
- LLMs Oriented to Neurodegenerative Research. ISCI 2024, TecNM.
- Type-2 Fuzzy Deep Learning Approach Applied to Classify Alzheimer's Disease. IPN-CITEDI, AI and Quantum Computing Seminar 2024.
- Automated Insights: LLMs in Neurodegenerative Disease Research and Comparison. MICAI 2024, SMIA Workshop.