Jose G. Perez

Applied Research Scientist (Ph.D.)
Computer Vision & MLOps

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🔗 https://developerjose.github.io

Applied ML Researcher (Ph.D.) specializing in multispectral satellite imagery and physics-guided deep learning. Experienced in developing data-efficient deep learning models, deploying ML pipelines, and bridging theoretical physics with practical engineering applications. Formerly a Research Intern at JHU Applied Physics Lab, focusing on one-shot classification and model orchestration.

Profiles

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in developerjose

Languages

English
Bilingual

Spanish
Bilingual

Skills

Machine Learning

PyTorch, PyTorch-Lightning, Tensorflow, Keras, Pandas, NumPy, SciPy

MLOps

Prefect, FastAPI, Streamlit, mlflow

Programming

Python, Java, Typescript, PHP

Large Language Models

llama.cpp, MCP servers, hybrid CPU/GPU setups

Computer Vision

OpenCV, scikit-learn

Deployment & DevOps

Docker, Docker Compose, Git, CI/CD

Education

University of Texas at El Paso (UTEP)   August 2018 - December 2025
Ph.D. in Computer Science
3.91 GPA

Thesis: Physics-Guided Strategies for Enhancing Neural Networks Trained With Limited Data

University of Texas at El Paso   August 2015 - May 2018
B.Sc. in Computer Science
3.77 GPA

Minor in Biomedical Engineering and Math

Publications

Physics-Informed Glacier Ice Segmentation of HKH Region Using Multispectral Satellite Imagery   2026
In Progress

J. G. Perez*, O. Fuentes

Field Predictions of Hypersonic Cones Using Physics-Informed Neural Networks   2022
Proceedings of the ASME 2022 Fluids Engineering Division Summer Meeting

D. Villanueva, B. Paez, A. Rodriguez, A. Chattopadhyay, V.M. Kotteda, R. Baez, **J. G. Perez***, J. Terrazas, V. Kumar

Physics-Informed Long-Short Term Memory Neural Network Performance on Holloman High-Speed Test Track Sled Study   2022
Proceedings of the ASME 2022 Fluids Engineering Division Summer Meeting

J. G. Perez*, R. Baez, J. Terrazas, A. Rodriguez, D. Villanueva, B. Paez, A. Cruz, O. Fuentes, V. Kumar

Empirical Game-Theoretic Methods to Minimize Regret Against Specific Opponents   2021
Proceedings of SPIE Defense + Commercial Sensing Symposium

M. Porag, **J. G. Perez***, C. Kiekintveld, T. Son, W. Yeoh, E. Pontelli

Computer vision evidence supporting craniometric alignment of rat brain atlases to streamline expert-guided, first-order migration of hypothalamic spatial datasets   2018
Frontiers in System Neuroscience

A. M. Khan, **J. G. Perez***, C. Wells, O. Fuentes

Experience

University of Texas at El Paso (UTEP)   May 2018 - December 2025
Research Assistant and Teaching Assistant   El Paso, Texas

- Helped **teach** Data Structures, Computer Vision, Deep Learning, and Machine Learning courses.
- Developed **Physics-Informed U-Net** in **PyTorch** for glacier ice segmentation, adding velocity-based loss functions and physics-informed augmentations to achieve a state-of-the-art Debris-Covered Ice IoU improvement of 28%.
- Built hybrid **Physics-Informed LSTM** models in **PyTorch** for fluid flow velocity prediction, combining two architectures into hybrid model achieving 73–85% improvement over LSTM-only baselines.
- Mapped rat brain images to labeled atlases using **OpenCV** feature-based matching (**SIFT+RANSAC**).
- Developed a **Deep Q-Network** for the **PowerTAC** retail market simulation competition using **Deeplearning4j** in **Java**.
- Configured and maintained **Ubuntu** servers with **NVIDIA GPUs**.

Johns Hopkins University Applied Physics Lab (APL)   May 2023 - December 2024
Machine Learning Ph.D. Intern for AOS/QAC LIVELab   Laurel, Maryland

- Trained **PyTorch** models for **multispectral satellite image** classification.
- Trained **Triplet Loss**-based **PyTorch** models for **real-time one-shot** image classification.
- Worked on the orchestration of **PyTorch** models using **Prefect** to schedule, coordinate, and monitor essential machine learning tasks.
- Created and deployed custom **Docker** images to deploy **Prefect** using **Docker Compose**.
- Created **Gitlab** CI / CD pipelines for linting, unit testing, and artifact creation.
- Developed a **Streamlit** app for text processing that incorporates **prompt engineering** using different OpenAI ChatGPT models.
- Helped to create models for mission-dependency visualization using **APL Dagger**.

University of Texas at Austin   June 2016 - August 2016
Undergraduate Research Assistant   Austin, Texas

- Created a basic multiscale model of the interactions between T cells and APCs using **CompuCell3D** in Python.

Awards

CAHSI Travel Award   September 2017, 2022, and 2023
The University of Texas at El Paso

Travel award for the Great Minds in Stem (GMiS) conference.

Google-CAHSI Dissertation Award   August 2022
The University of Texas at El Paso

$25,000 award for Hispanics in Computer Science Ph.D. programs.

BUILDing Scholars Biomedical Research Traineeship   July 2015 - May 2018
National Institutes of Health

Research-intensive undergraduate full-ride scholarship.

BUILDing Scholars Travel Award   October 2016 & October 2017
The University of Texas at El Paso

$1,000 Travel award for the conference poster presentations.