Jose G. Perez

✉ josegperezdev@gmail.com   github.com/DeveloperJose   in linkedin.com/in/DeveloperJose

Education

Ph.D. in Computer Science 📅 **Expected May 2025**
*Research focus on neural networks trained with **multispectral satellite images**.* 📍 *University of Texas at El Paso*
Thesis: Improving Neural Networks Trained With Limited Data By Deriving Improvements
    Based on Knowledge of The Underlying Physics Interactions.

B.Sc. in Computer Science 📅 **Awarded May 2018**
*Minor in Biomedical Engineering and Math, **GPA: 3.75*** 📍 *University of Texas at El Paso (UTEP)*

Research Experience

Machine Learning Ph.D. Intern 📅 **May 2023 - December 2024**
AOS/QAC LIVELab 📍 *Johns Hopkins University Applied Physics Lab (APL)*
- 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**.

Research Assistant 📅 **August 2016 - May 2025**
Vision and Learning Laboratory 📍 *UTEP*
- Working on incorporation of physics for glacial ice **segmentation** from **multispectral** images using **U-Net** in **PyTorch**.
- Working on incorporation of physics for glacial ice **velocity prediction** from **multispectral** images in **PyTorch**.
- Developed **Physics-Informed LSTMs** for next frame prediction of 2D fluid simulation data using **PyTorch**.
- Developed system mapping rat brain images to labeled atlases using **OpenCV** through feature-based matching with **SIFT** and **RANSAC**.
- Developed a program to generate synthetic images of rat brain images using **OpenCV** through multi-point warping.
- Configured and maintained **Ubuntu** servers with **NVIDIA GPUs** for the research group.

Graduate Research Assistant 📅 **June 2019 - May 2020**
Artificial Intelligence Lab 📍 *UTEP*
- Developed and trained **Deep Q-Network** for PowerTAC retail market simulation competition using **Deeplearning4j** in Java.

Undergraduate Research Assistant 📅 **June 2016 - August 2016**
Cellular Sensing and Communications Dynamics Research Group 📍 *UT Austin*
- Created a basic multiscale model of the interactions between T cells and APCs using **CompuCell3D** in Python.

Teaching Experience

CS2302 - Data Structures 📅 **Fall 2020 - Summer 2022, Fall 2023**
Teaching Assistant 📍 *UTEP*

Intro to Machine Learning for US Army in White Sands Missile Range 📅 **Summer 2021**
Teaching Assistant 📍 *UTEP*

CS4363/5363 - Computer Vision with OpenCV (undergrad and grad hybrid course) 📅 **Spring 2021**
Teaching Assistant 📍 *UTEP*

CS4371 - Deep Learning with TensorFlow and Keras 📅 **Spring 2019**
Teaching Assistant 📍 *UTEP*

CS1310 - Intro to Computational Thinking with Applications to Brain Mapping 📅 **Fall 2018**
Teaching Assistant 📍 *UTEP*

Publications

J. Perez*, O. Fuentes, *"Physics-Informed Glacier Ice Segmentation of HKH Region Using Multispectral Satellite Imagery"*. **In Progress**, 2025.

J. Perez*, O. Fuentes, *"Physics-Informed Glacier Ice Velocity Prediction of HKH Region"*. **In Progress**, 2025.

J. Perez*, B. Aryal, O. Fuentes, *"Improving Glacier Ice Segmentation of HKH Region Using Multispectral Satellite Imagery With Physics-Informed Data Augmentation"*. **In Progress**, 2025.

D. Villanueva, B. Paez, A. Rodriguez, A. Chattopadhyay, V.M. Kotteda, R. Baez, **J. Perez***, J. Terrazas, V. Kumar, *"Field Predictions of Hypersonic Cones Using Physics-Informed Neural Networks"*. **Proceedings of the ASME 2022 Fluids Engineering Division Summer Meeting**, 2022.

J. Perez*, R. Baez, J. Terrazas, A. Rodriguez, D. Villanueva, B. Paez, A. Cruz, O. Fuentes, V. Kumar, *"Physics-Informed Long-Short Term Memory Neural Network Performance on Holloman High-Speed Test Track Sled Study"*. **Proceedings of the ASME 2022 Fluids Engineering Division Summer Meeting**, 2022.

M. Porag, **J. Perez***, C. Kiekintveld, T. Son, W. Yeoh, E. Pontelli, *"Empirical Game-Theoretic Methods to Minimize Regret Against Specific Opponents"*. **Proceedings of SPIE Defense + Commercial Sensing Symposium**, 2021.

A. Khan, **J. Perez***, and O. Fuentes, *"Computer vision evidence supporting craniometric alignment of rat brain atlases to streamline expert-guided, first-order migration of hypothalamic spatial datasets"*. **Frontiers in System Neuroscience**, 2018.

Awards

CAHSI Travel Award   📅 **September 2017, 2022, and 2023**
*Travel award for the **Great Minds in Stem (GMiS)** conference.*   📍 *UTEP*

Google-CAHSI Dissertation Award   📅 **August 2022**
$25,000 award for Hispanics in Computer Science Ph.D. programs.   📍 *UTEP*

BUILDing Scholars Biomedical Research Traineeship   📅 **July 2015 - May 2018**
Research-intensive undergraduate full-ride scholarship funded by the National Institutes of Health.   📍 *UTEP*

BUILDing Scholars Travel Award   📅 **October 2016 & October 2017**
$1,000 Travel award for the conference poster presentations.   📍 *UTEP*
Biomedical Engineering Society (BMES) 2016, **Society for Neuroscience (SFN)** 2017

Skills

Languages: Bilingual in **English** and **Spanish**.

Programming: Highly proficient in **Python** and **Java**.

ML Frameworks: Proficient with **PyTorch**, **TensorFlow**. Very familiar with **Keras**, **OpenCV** and **sk-learn**. Slightly familiar with PyTorch-Lightning, KerasTuner, and Ray Tune.

MLOps Frameworks: Highly familiar with **Prefect**.

Technologies: Proficient in **Ubuntu**, **Docker** and **Docker-Compose**. Some knowledge of Ansible and TrueNAS Scale.

Poster Presentations and Talks

J. Perez, *"Learning to Compare: Relation Network for Few-Shot Learning"*. UTEP CS Seminar, 2021.

J. Perez, *"EfficientNet: Rethinking Model Scaling for Convolutional Neural Networks"*. UTEP CS Seminar, 2021.

J. Perez, *"You Only Look Once: Unified Real-Time Object Detection"*. UTEP CS Seminar, 2020.

J. Perez, *"Neural Style Transfer: Image Style Transfer Using Convolutional Neural Networks"*. UTEP CS Seminar, 2020.

J. Perez, O. Galindo, D. Almeraz, and V. Kreinovich, *"How to Apply Quantum Computing to Machine Learning"*. 25th Joint UTEP/NMSU Workshop on Mathematics, Computer Science, and Computational Sciences, 2019.

J. Perez, A. M. Khan, and O. Fuentes, *"Generation of synthetic rat brain atlas plates at the level of the hypothalamus using multipoint warping"*. Society for Neuroscience Conference, 2019.

J. Perez, A. M. Khan, and O. Fuentes, *"Automatic derivation of atlas plate correspondences between rat brain atlases using feature-based matching and dynamic programming"*. Society for Neuroscience Conference, 2018.

J. Perez, A. M. Khan, and O. Fuentes, *"Towards Automatic Registration of Histological Data to Canonical Brain Atlases"*. Society for Neuroscience Conference, 2017.

J. Perez, M. Bloom, and M. Behar, *"Multi-Scale Modeling of T Cell and Antigen Presenting Cell Interaction in the Tumor Microenvironment"*. Biomedical Engineering Society Conference, 2016.

Certifications

MCP, **MTA:** Software Dev. Fundamentals, **MOS:** Word 2010 Expert, Excel 2010, PowerPoint 2010