

Pablo Leyva

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EDUCATION

New Jersey Institute of Technology

B.S. in Applied Mathematics (Statistics) & Computer Science (AI Concentration)

Newark, NJ

Aug 2023 – May 2027

Relevant Coursework:

Data Structures & Algorithms, Computer Vision, Linear Algebra, Statistical Learning, Numerical Methods, Deep Learning PhD Coursework

TECHNICAL SKILLS

Languages : Python, Typescript, JavaScript, Java, C++

Frameworks : React, NEXT.JS , Node, PyTorch, TensorFlow, scikit-learn, LangChain, LangGraph, MCP

Libraries : Jupyter Notebook, Pandas, NumPy, Pytest, scipy, FastAPI, Flask

Machine Learning : Linear Regression, Logistic Regression, K-Means Clustering, K-Nearest Neighbors (KNN)

AI/ML : Computer Vision (CV), Neural Networks (DNN, CNN, RNN), Deep Learning, Reinforcement Learning

MLOps : Model Deployment, Data Pipelines, Docker, CI/CD, AWS, GCP, Azure, GitHub Actions, linux, kubernetes, unix

PROJECTS

Liquid Neural Networks | PyTorch, CUDA, Python

- Developed a Liquid Neural Network (LNN) from scratch to explore efficient, continuous-time architectures for **Computer Vision**
- Benchmarked the custom LNN on **CIFAR-10 outperforming recurrent baselines** in temporal stability and robustness to frame-rate irregularities in simulated driving environments

Predictive Visual Motion Modeling for Crowd Flow Analysis | PyTorch, OpenCV, Numba, Python

- Engineered a real-time **computer vision pipeline** to model and forecast pedestrian trajectories using YOLOv5 detection, Kalman filtering, and LSTM-based temporal modeling
- Designed a **custom motion-smooth loss function** combining MSE and directional regularization; optimized preprocessing with sparse optical flow to reduce latency by 40%

3D Scene Reconstruction and Object Association from Multi-View Feeds | C++, OpenCV, Eigen, Python

- Developed a multi-view geometry system to reconstruct **3D object positions** via ORB feature extraction, BFMatcher correspondence, and epipolar-based triangulation
- Implemented nonlinear **bundle adjustment** using the Levenberg–Marquardt algorithm and spatial hashing for memory-optimized 3D reconstruction
- Delivered sub-10 cm spatial accuracy and a 2.5× speedup through **vectorized NumPy/Eigen operations** and modular C++/Python integration

EXPERIENCE

Undergrad Researcher (CAHSI) - Multilingual LLM Training and Bias Analysis

October 2025 – Present

Research Candidate

Newark, NJ

- Build and train a **foundational multilingual model** on Spanish, Portuguese, Italian, Farsi, and Arabic, with the primary objective of enabling the model to "think" and reason in native languages rather than through translation
- Train specialized **Small Language Models (SLMs)** on individual target languages and benchmark performance against a foundational multilingual LLM to **compare efficiency versus accuracy tradeoffs**

Undergrad Research and Innovation (URI) - Efficient SLM for Agentic Workflows

Sep 2025 – Present

Research Candidate

Newark, NJ

- Apply **research techniques** and **algorithm** design to develop an 3B parameter SLM architecture
- Integrate lightweight adapter layers (e.g., LoRA) to specialize the model for structured business workflows

Apple

AI/ML Product Engineering Intern

May 2025 – August 2025

Cupertino, CA

- Combined **Large Language Model(LLMs)** with **Model Context Protocol (MCP)** using Typescript and Python
- Used **LangChain & LangGraph** to facilitate agent infrastructure and validation

COMMUNITY OUTREACH

President, Vice President - External Affairs, Event Coordinator

October 2023 – Present

Society of Hispanic Professional Engineers (SHPE)

Newark, NJ

- Confidently leading a team of 20 to organize professional events for 300+ students across campus using articulate communication
- Grew our External Company connections by 6x in only two months through confident outreach and relationship building
- Successfully breaking attendance records on a weekly basis by averaging 200% growth in member engagement