

# 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

### Alpha Signal Research & Backtesting Engine | *Python, NumPy, Pandas, Statsmodels, Matplotlib*

- Developed a modular **backtesting framework** to evaluate 20+ alpha signals using equities and macroeconomic data with custom factor modeling.
- Implemented **statistical testing and time-series forecasting** to identify signal persistence, achieving a 1.47 Sharpe ratio under realistic transaction costs.
- Automated **portfolio rebalancing and risk scaling** for systematic strategy simulation using historical data from Quandl and Yahoo Finance APIs.

### Machine Learning–Driven Portfolio Optimization | *Python, Scikit-learn, CVXPY, PyTorch, Pandas*

- Built a **reinforcement learning–inspired optimizer** for dynamic asset allocation using predicted returns and risk covariance modeling.
- Applied **convex optimization (CVXPY)** under Sharpe and drawdown constraints, outperforming mean-variance baselines by 12% annualized returns.
- Trained **LSTM-based predictors** for multi-asset returns to inform adaptive portfolio rebalancing and volatility-aware decision-making.

### Market Microstructure Simulator & Statistical Arbitrage System | *Python, NumPy, SciPy, Plotly, FastAPI*

- Designed a synthetic **order book simulator** using Poisson processes to replicate trade arrival, liquidity imbalance, and order matching behavior.
- Applied **co-integration and mean reversion models** for identifying arbitrage pairs with over 60% backtested profitability across simulated markets.
- Developed a **FastAPI dashboard** to visualize live PnL trajectories, signal confidence, and latency-adjusted execution metrics.

## 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(LLM)s** 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