Philip Pincencia

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Education

University of California San Diego — **September 2022 - June 2026**
BS in Computer Engineering, Minor in Mathematics - 3.82/4.00 GPA — *La Jolla, CA*

- **Relevant Coursework**: Operating Systems, Graduate Digital Signal Processing, Graduate Linear Algebra, Graduate Convex Optimization, Stochastic Processes, Abstract Algebra, Computer Architecture, Data Structures and Algorithms, Deep Learning, Networking, AI.

Experience

DSP Systems Engineer Intern — **June 2025 – Present**
huMannity Medtec — *Valencia, CA*

- Working on building prediction algorithms and ETL pipeline for low-level biomarkers.

Software Engineer Intern — **October 2024 – March 2025**
Qualcomm Institute — *La Jolla, CA*

- Built **real-time audio controls** (speed/pitch) using **PVOC** in JavaScript with **WaveSurfer** API.
- Translated **Figma designs** into a dynamic web interface using **Next.js**, Tailwind CSS, and React.
- Implemented **music library management** in Python and handled metadata via JSON; collaborated using **GitLab**.

Undergraduate Researcher — **June – August 2024**
Jacobs School of Engineering — *La Jolla, CA*

- Built a **Variable Order Markov Model** using a **Multiway Trie** in **Object-Oriented Python** to model melodic dynamics in jazz solos.
- Parsed raw chord changes from the WJazz Database with **C++** and **Regex** for efficient data processing.
- Benchmarked 3 analysis methods and identified the best approach via **Machine Learning** models.

Leadership

Signal Processing Chair — **August 2024 – May 2025**
IEEE@UCSD — *La Jolla, CA*

- Led team to work on **DeepFake Detection** using **Kubernetes** and **Docker** to set up storage and dependencies.
- Implemented and evaluated different architectures including CNN, Xception, and Wavelet-Clip and achieved 96% accuracy on the validation set with over **10,000** images.

Projects

Stochastic Deep Learning for Optimal Trading Strategies | *Python, PyTorch, Finance, Jupyter Notebook*

- Implemented stochastic trading models visualizing price impact distributions and achieving a **2.7% improvement** in Sharpe ratio using nonlinear feedback strategies.
- Developed a **neural network-based trading strategy** that reduced computation time by **60%** compared to numerical solvers, with training achieving **98% accuracy** in approximating optimal feedback controls.

Demand Paging and Page Replacement in Linux VM | *Java, Linux, Git, OS Kernel, Virtual Memory, Synchronization*

- Implemented demand paging to load virtual pages on fault, cutting memory allocation overhead by **40%**.
- Built a clock-based replacement policy, reducing page fault latency by **35%**.
- Added global swap file and page pinning logic, achieving **95%** page fault resolution.

Autoregressive Forecasting with Differencing | *C++, Python, CMake, Time Series*

- Built a synthetic stock forecasting pipeline using **first differencing** and AR modeling on GBM data.
- Implemented the **Levinson-Durbin algorithm** in C++ with automated AR order selection via MSE and MAPE.
- Visualized predictions in Python, achieving up to **98% accuracy** in trend reconstruction.

Technical Skills

Languages: Python, MATLAB, C/C++, Java, JavaScript, ARM Assembly, LaTeX, SystemVerilog
Tools/Libraries: WireShark, JUnit, gdb, Vim, Git, Regex, React, PyTorch, Docker, Kubernetes, NoSQL, Restful APIs

Achievement

US Top 13 IEEEXtreme 2024 **Coding Competition**, UCSD Integration Bee Top 8, World Mathematics Invitational Finalist