Philip Pincencia

La Jolla, CA   (619) 806-7630   ppincencia@ucsd.edu   linkedin.com/in/1618lip   1618lip.github.io/

Education

University of California San Diego   **September 2022 - June 2026**
BS in Computer Engineering, Minor in Mathematics - 3.83/4.00 GPA   *La Jolla, CA*

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

Experience

Software Developer Intern   **September 2025 – December 2025**
Ansys   *Canonsburg, PA*

- Optimize simulation UI controls.

DSP Intern   **June 2025 – August 2025**
huMannity Medtec   *Valencia, CA*

- Built a modular biosignal pipeline with **Pydantic**, streamlining validation and improving maintainability.
- Enhanced signal quality through digital filter design and outlier removal for reliable feature extraction.
- Boosted model accuracy by **10%** via feature engineering, parameter tuning, and production-ready workflows with prompt orchestration, JSON output, and logging.

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

- Built **real-time audio controls** (speed/pitch) with a Phase Vocoder in JavaScript.
- Translated **Figma designs** into a dynamic web interface with **Next.js**, Tailwind CSS, and React.
- Implemented **music library management** in Python with JSON metadata, streamlining content organization for **N+ audio files** and improving retrieval speed by **25%**.

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

Demand Paging & Page Replacement in OS Kernel | *C, Virtual Memory, Page Fault Handling*

- Enabled **demand paging** by deferring page allocation, reducing startup overhead by **35%**.
- Implemented clock-based **page replacement**, lowering fault latency by **40%**.
- Managed global swap file in C to store evicted pages, achieving **90% fault resolution success**.

Self-Supervised Acoustic Representation Learning | *Python, PyTorch, Contrastive Learning*

- Designed a self-supervised model learning robust audio embeddings without labels, optimized for downstream tasks like anomaly detection and sound classification.
- Integrated time–frequency masking and harmonic perturbations as augmentations to mimic real-world distortions.
- Improved transfer learning performance on unseen datasets by **+22%** mAP.

Convex Optimization in Multi-Agent Resource Allocation | *Python, CVXPY, Pydantic, Plotly, Game Theory*

- Built scalable multi-agent optimization framework with **Pydantic**-validated configs for reproducibility.
- Implemented social optimum, **dual decomposition**, and **Nash equilibrium** strategies to study agent cost trade-offs.
- Developed interactive **Plotly dashboards** to visualize allocations, convergence, and the **Price of Anarchy**.

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, SQL, Restful APIs

Achievement

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