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**

Bachelor of Science in Computer Engineering, Minor in Mathematics - 3.97/4.00 GPA *La Jolla, CA*

- **Relevant Coursework**: Algorithm Design and Analysis, Advanced Data Structures, Computer Architecture, Digital Signal Processing, Random Processes, Abstract Algebra, Optimization, Digital Logic.

Experience

Software Engineer Intern **October 2024 – Present**

Qualcomm Institute *La Jolla, CA*

- Developing audio processing algorithms to enhance real-time interactivity on a React webapp using **Next.js**. Implemented speed and pitch control using Phase Vocoder technique as a prototype in MATLAB and implemented in **JavaScript**.

Signal Processing Chair **June – Present**

IEEE@UCSD *La Jolla, CA*

- Leading a team of 8 undergraduates to work on DeepFake Detection. Utilize DSP and Machine Learning to classify whether the image is real or computer-generated.
- Set up the whole team in NRP and uses **Kubernetes** and **Docker** for reliable dependencies and storage.

Undergraduate Researcher **June – August 2024**

Jacobs School of Engineering *La Jolla, CA*

- Designed and Implemented a **Variable Order Markov Model** algorithm using a **Multiway Trie** in Python to analyze the temporal dynamics of melodic complexity in jazz solos.
- Processed raw chord changes from the WJazz Database using **C++** and **Regex**, reducing at least **50%** of time spent parsing data compared to manual labor.
- Researched and benchmarked 3 analysis methods, identifying the most suitable approach and performed statistical methods to induce pitch probability distribution given harmonic context.

ECE Tutor **April – Present**

Jacobs School of Engineering *La Jolla, CA*

- Tutored undergraduate students in a **signals & systems and Probability class** and facilitated learning by proctoring quizzes and final exam, conducting weekly office hours, answering 200+ questions on the online class forum with an average response time of 5 minutes.
- Lead 5 **Quiz Reviews** to help prepare for the upcoming quiz by meticulously formatting the questions and drawing plots and circuits using LaTeX to resemble the true quiz style.

Projects

Speaker Recognition | *MatLab, LaTeX* **July - August 2024**

- Implemented a Speaker Recognition System in *MatLab* using **Mel-Frequency Cepstrum Coefficients** (MFCC), vector quantization and K-clustering.
- Tuned the **Kaiser-Bessel** Window Size, Number of Mel Filter Banks, Number of MFCCs, and Number of Centroids for maximum performance, which yields more than **80%** in accuracy from the test data set and a tolerance of at least **18dB SNR** of added noise.

Data Structures | *Java, JUnit, C++, make* **March - June 2023**

- Implemented Linked List, Deque, Heap, Priority Queue, BST, and Graph-based algorithm with clean Java and C++.
- Wrote 100+ test cases in JUnit to assess the implementation correctness, making sure it hits the edge cases and practiced good **Object-Oriented Principles** to allow code reusability and maintainability.

High-Frequency Trading Tick Data Compression | *C++, Python* **July - August 2024**

- Developed a file compression and decompression tool using **Huffman and Arithmetic Coding** given tick data, achieving a 45% reduction in storage with 95% accuracy for Arithmetic Coding and 100% accuracy for Huffman Coding.
- Reduced compression size further by 3-5% through denoising and filtering with Haar Wavelet Transforms.

Technical Skills

Languages: Python, Java, JavaScript, C/C++, ARM Assembly, LaTeX, SystemVerilog
Tools/Libraries: VSCode, JUnit, gdb, Vim, Git, Regex, React
Languages: Indonesian (Native), English (Professional)

Achievement

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