Rona Linarez

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EDUCATION

Pomona College | Cumulative GPA 3.8 — Claremont, CA

Bachelor of Arts: Computer Science, Minor in Mathematics — May 2025

Relevant Coursework: Data Structures and Algorithms, Programming Design Methodologies, Intro to Languages and Theory, Natural Language Processing, Game Engine Programming, Data Mining, User-Centered Research, Real Analysis, Computer Systems

PROFESSIONAL EXPERIENCE

Pomona College | Database Research Assistant | *Claremont, CA* — August 2023 – Present

- Refactored the backend of a video game emulation server to implement transactions, enhancing data integrity and reliability for large-scale SQL queries.
- Refactored codebase by replacing hardcoded logic with **treemagic**, improving maintainability and cross-platform compatibility.
- Host weekly mentor sessions for 40 Discrete Math and Functional Programming students, where I provide constructive feedback and guidance on core computer science concepts.
- Mentor a learning community of 6 computer science students where I clarify class concepts in a positive and engaging learning environment once a week; help correct and bug fix students' **Java** and **Haskell** code.

Washington University in St. Louis | Software Engineering Researcher | *St. Louis, MO* — May 2023 – July 2023

- Programmed a closed-loop PID control system in **Python** that utilized IMU and Lidar sensor data for fusion control to accurately manage the speed, yaw, and position of an F1/10 car.
- Analyzed the performance of reinforcement algorithms for autonomous maze navigation on the Rosmaster R2 platform; my research focused on simulating safe paths that avoid obstacles while maintaining forward progress towards a goal.
- Implemented a waypoint trajectory system that utilized our vehicle's **SLAM** and **LiDAR** sensors to create a simplified global planner path; built our own **ROS** package to communicate sensor data in our system.

Google Computer Science Summer Institute | Intern | *Remote* — July 2021 – August 2021

- Selected for a competitive, Google-led 4-week JavaScript and front-end development program focused on modern web technologies. Collaborated with a Software Engineering Mentor and a 30-person peer cohort.
- Built an educational web game in a three-person team using React to create dynamic, component-based user interfaces. Designed and implemented responsive visuals with HTML/CSS, used browser cookies to persist game progress.

PROJECTS AND RESEARCH

Image-to-Music Recommendation System

- Integrated Spotify API to generate personalized playlists based on input image descriptions, leveraging the Hugging Face Cross Encoder for feature prediction to yield specific songs.
- Designed and trained a CNN model using **PyTorch** on a dataset of 1,000 images across 10 categories, incorporating random rotations and successive epoch training achieving a minimum accuracy of 69%.
- Utilized SpotiPy library to automate the creation of curated playlists, seamlessly generating song recommendations to enhance user engagement and personalization.

Rust Game Engine: Shooter and Pokémon-style RPG

- Developed a game engine in **Rust** built on Frenderer, optimized **wgpu** rendering pipeline for smooth performance and memory efficiency across different hardware configurations.
- Implemented an animation system that utilized delta time to render frames accurately using **winit**, optimizing sprite management for high object counts.
- Designed a robust collision system using bounding boxes to detect and correct object intersections, ensuring precise gameplay interactions and control.

Research Paper: Extremal Polynomial Norms of Graphs

- Researched Ky-Fan, Schatten, and complete homogeneous symmetric norms of graphs, and analyzed their ability to distinguish between graphs using the eigenvalues of their adjacency matrices.
- Collaborated weekly with a mathematics professor, solving problems involving Hermitian matrices and L2 norms; contributed to drafting a research paper with illustrative examples and theoretical insights.

TECHNICAL SKILLS

Languages: Python, C++, Java, Rust, Scala, SQL, R, Haskell, HTML/CSS/JavaScript.

Frameworks and Libraries: React Native, PostgreSQL, MySQL, PyTorch, OpenCV, Gensim, Tidyverse, NumPy, treemagic.

Tools: Linux, Unix, Git, Robot Operating System, Quarto, Audacity