

RIAN BUTALA

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Education

UC Los Angeles | Incoming Freshman, B.S. Computer Science | Class of 2030

Stratford Preparatory | GPA: 4.83W / 3.96U | National Merit Finalist | AP Scholar with Distinction | *Coursework: AP CS A, Calculus BC, Statistics, Physics [2, C Mech, C E&M], AI Models, Full-Stack Dev.*

Technical Skills

- **Frameworks:** PyTorch, JAX/XLA, Hugging Face, LangChain.
- **Distributed/Cloud:** GCP (TPU/TRC), SPMD/FSDP, Docker, Linux.
- **Architectures:** Transformers (LLM/ViT), Diffusion (DDPM/Flow Matching), RL (SFT/PPO).

Research / Experience

UCLA Blair Lab, Neuroscience & AI Research | *Research Assistant*

- **Neural Modeling:** Invited to analyze neural recordings and maze location data alongside graduate students.
- **Decision Transformers:** Optimized DTs with **RCP-R** (reward conditioned policy) to replicate behavioral accuracy using high-dimensional spike and position embeddings.

FinanceGPT Labs | *AI Intern*

- **Predictive Modeling:** Refined stock prediction models via gradient boosting and adversarially trained **VAEs**.
- **LLM Tooling:** Evaluated SLM tool-calling and structured output generation for financial data pipelines.

Technical Projects

Custom Large Language Model (LLM) | *Developer* | [Demo](#) | [Github \(v1\)](#) | [Github \(v2\)](#)

- **Core:** Built decoder-only Transformer from scratch; custom tokenizer & training pipelines.
- **Infra:** Distributed training on **TPU v4 pods (Google TRC)** via **SPMD/FSDP**; implemented parameter sharding.
- **Alignment:** 5-stage pipeline: Pre-train → 2x Instruction SFT → CoT SFT → Offline RL.

Denosing Diffusion Probabilistic Model (DDPM) | *Developer* | [Github \(WIP\)](#)

- **Diffusion:** Manual (no agents!) implementation of **beta-scheduled UNet**; 12 iterations of noise-reduction math optimization.
- **Current:** Replicating **Qwen-Image MMDiT** via **XLA**; pivoting to **rectified flow matching**.

LANTERN (Edge Security & Relay Network) | *Lead Developer*

- **Design:** Low-power edge nodes with on-demand AI inference for campus intrusion detection.
- **Success:** Developed high-throughput classification system; **fully funded** by Spring Education Group CEO for campus deployment.

OtterBox (Gamified Social Wellness) | *Lead Developer* | [Github](#)

- **Mobile:** **Next.js 16** + **Capacitor 8** iOS deployment; bypassed **WKWebView** persistence hurdles via custom IndexedDB/Firebase sync.
- **Social & AI:** **GPT-4 Vision** meal analysis; geospatial social graph via **Firestore/Leaflet** with distance-filtered leaderboards.
- **Engine:** Date-seeded RNG quest generator & non-linear XP leveling logic.

Leadership and Activities

School Robotics Club (FTC Team 21781 / FRC Team 10252), 2022-2026 | *Founding Member* | *Team Captain, Vice President, Software Lead*

- **Leadership:** Led all code development and mentored team members in a new program with no legacy code or senior mentors.
- **Technical Impact:** Introduced AprilTag detection for autonomous scoring. Refactored drive code mid-competition after hardware failure, leading to "Best Defensive Robot" recognition by announcers.