

# Lumina Mescuwa

AI Systems Architect & Independent Researcher

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Visionary AI Architect with a proven ability to direct the development of novel neural architectures and complex autonomous systems. Synthesizes a rigorous STEM background with an AI-native workflow to rapidly translate ambitious blueprints into robust, functional code.

## Key Projects & Research

### Epsilon: A Transformer with Sub-Quadratic Attention Complexity

- Designed novel Transformer architecture reducing attention complexity from  $O(n^2)$  to  $O(nB)$  via Histogram Quantized Scalar Attention, achieving 90.1% validation accuracy vs 85.1% baseline with 1.5x speedup.
- Authored 9-page technical whitepaper with formal mathematical analysis including contraction mapping stability proofs and adaptive computation mechanisms.

### Prometheus: An Autonomous AI Framework for Scientific Discovery

- Architected a multi-agent autonomous system that replicates the full scientific method, integrating LLM-driven hypothesis generation with physics-based molecular docking and MD simulations.
- Engineered the end-to-end scientific workflow, from building a knowledge base over research papers with LanceDB to the final, data-driven discovery of a novel molecule with a superior composite score.

### CodeTag: A Professional-Grade Developer Tool

- Built and open-sourced a developer utility with a TUI/CLI for codebase analysis, professionally packaged and distributed via `pipx`.
- Integrated third-party security scanners (Semgrep, OSV-Scanner) into a unified, security-first analysis pipeline.

## Technical Skills

Languages	Python, C++, SQL, LaTeX
AI & ML	PyTorch, Transformers, Neural Network Architecture, Autonomous Agentic Systems, Natural Language Processing (NLP), Vector Databases (LanceDB)
Developer Tools	Git, GitHub, Docker, VS Code, pytest, ruff, Tree-sitter, Overleaf

## Education

### University of California, Los Angeles (UCLA)

Biochemistry, B.S. Program (Completed 42 upper-division units)

Los Angeles, CA

Attended 2023–2025

### Chabot & Affiliated Colleges

Associate in Science for Transfer (AS-T), Biology (GPA: 4.0) with 126 transfer units.

Bay Area, CA

Completed Spring 2023

- Completed 126 units of IGETC-certified transfer coursework, including full Calculus, Chemistry, and Physics sequences.

## Experience

### Biotechnology Research Intern

Counter Culture Labs

Contributed to a novel genetic engineering project focused on the heterologous expression of the antiviral lectin Griffithsin in rice calluses. Gained hands-on proficiency with the full molecular biology workflow, from DNA purification and construct design to biolistic particle delivery via gene gun.

### Teaching Assistant, General Chemistry

Mission College

Selected by faculty to lead university-level laboratory sessions. Responsible for clarifying complex chemical concepts, demonstrating advanced techniques, and enforcing rigorous safety protocols.

### Academic Tutor (General Science & Communications)

Chabot & Mission College

Recommended by faculty to mentor students in foundational sciences and advanced public speaking.

## Publications & Works

- Author:** *Epsilon: A Transformer with Adaptive Computation*. Technical whitepaper detailing a novel neural network architecture. (2025)
- Benchmark Creator:** Creator of [The Apollyon Benchmark](#), an open-source challenge testing the limits of logical reasoning in SOTA LLMs.
- Author (Fiction):** Two in-progress sci-fi/fantasy novels exploring themes of AI and systemic logic (>125k words).