

# BRIAN ZHOU LIU

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## EDUCATION

University of California, San Diego

B.S. in Data Science (AI & ML Specialization)

La Jolla, California

GPA: 3.97/4.00 | June 2027

## TECHNICAL SKILLS

**Languages & Frameworks:** Python, SQL, PyTorch, TensorFlow, NumPy, Pandas, scikit-learn, React, FastAPI

**Tools & Platforms:** Git, MongoDB, Supabase, Google Cloud Platform (Cloud Run, Vertex AI, Cloud SQL)

**Concepts:** GenAI, Large Language Models (LLMs), RAG, Signal Processing, Data Visualization, Hardware Prototyping

## RESEARCH & PROFESSIONAL EXPERIENCE

ASAKANA

Product Development Intern

Remote | [\[LinkedIn\]](#)

October 2025 – Present

- Early-stage startup. Engineered an OCR bulk upload feature using Gemini Flash Lite to ingest product sheets (PDF/Excel) containing 10,000+ entries into a MongoDB cluster.
- Developing DialogflowCX agent to automate orders and pricing policies using Cloud SQL and Twilio SMS.

RARE AI LAB, UC SAN DIEGO

Research Intern (Advisor: Prof. Aobo Li)

La Jolla, California

September 2024 – Present

- Benchmarked ViTs, DeepSphere, and 3D ConvAEs against KamNet for neutrinoless double beta decay detection.
- Implemented a multi-fidelity optimization approach combining conditional neural processes and Gaussian processes to assess neutron background rates, significantly reducing computational costs of Monte Carlo simulations.
- **NeurIPS 2025 Workshop Paper:** Co-first authored "Efficient optimization of COHERENT detector design parameters with the Rare Event Surrogate Model (RESuM)," accepted to ML4PS ([Manuscript](#)).

MAIX LAB, EMORY UNIVERSITY

Research Intern (Advisor: Prof. Ran Xiao) | Regeneron STS Top 300 Scholar

Atlanta, Georgia

March 2023 – November 2023

- Evaluated 10 data compression methods using XResNet to improve heart attack diagnostics, identifying the 12-lead format for optimal performance and autoencoder for computational efficiency ([Manuscript](#)).
- Constructed anatomically informed feature tensor for XResNet, achieving 93.7% AUC ( $p < 0.001$ ) ([Conference Abstract](#)).
- Developed regional learners using 1D convolutional layers to capture cross-lead spatial patterns, stacking features into a 100-dimensional space to improve sensitivity to 85.5%.

## SELECTED PROJECTS

CARP: FISHERMEN HEALTH MONITOR & CATCH OPTIMIZATION SYSTEM

Stanford, California | [\[Slides\]](#)

Sushi Hackathon at Stanford University | 3<sup>rd</sup> Place

October 2025

- Engineered CTS diagnostic brace using Arduino Nano, load cells, and FSRs to measure grip and pinch strength.
- Developed a Python-based Bluetooth API to wirelessly transmit sensor data from the Arduino brace to a central application for real-time health analysis and CTS severity prediction.
- Built a full-stack dashboard featuring an AI agent with RAG for market insights, a health module to track CTS risk using the brace's data, and visualizations of a 50,000+ point dataset targeting optimal fish locations.

CITE TRACE: RESEARCH KNOWLEDGE GRAPH FOR INSIGHT DISCOVERY

Santa Clara, California | [\[Devpost\]](#)

ACM x Intel Hackathon | 1<sup>st</sup> Place

May 2025

- Developed an interactive knowledge graph that visually organizes academic works and their relationships, enabling intuitive exploration of research connections and semantic differences between papers.
- Implemented a full retrieval-augmented generation (RAG) system with an AI research agent, allowing users to query uploaded scientific literature and retrieve relevant information with cited sources.

PILLSNAP: PILL AND DRUG INTERACTION IDENTIFICATION

La Jolla, California | [\[Devpost\]](#)

UCSD DiamondHacks | MLH: Best Use of Auth0

April 2025

- Engineered a prediction module fusing Gemini-generated descriptions with FDA database API to identify probable drugs.
- Fine-tuned Gemini Flash 2.0 with Vertex AI to produce reliable, regulated pill descriptions given a prompt schema.
- Deployed full-stack app by hosting front-end on Vercel and backend API on Google Cloud Run, under custom domain.