BRIAN ZHOU LIU

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EDUCATION

University of California, San Diego — **La Jolla, California**
B.S. in Data Science (AI & ML Specialization) — *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 — **Remote | [LinkedIn]**
Product Development Intern — *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 — **La Jolla, California**
Research Intern (Advisor: Prof. Aobo Li) — *September 2024 – December 2025*

- 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 — **Atlanta, Georgia**
Research Intern (Advisor: Prof. Ran Xiao) | **Regeneron STS Top 300 Scholar** — *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 | **3rd 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.

CITETRACE: RESEARCH KNOWLEDGE GRAPH FOR INSIGHT DISCOVERY — **Santa Clara, California | [Devpost]**
ACM x Intel Hackathon | **1st 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.