Xiangjian (Shawn) Liu

(510) 565-2523 • xiangjl4@uci.edu • LinkedIn • GitHub • Portfolio

EDUCATION

University of California, Irvine
B.S. in Computer Science, GPA: 3.844/4.0 **Expected Graduation: June 2026**
Dean's Honor List: Fall 2022, Winter 2023, Spring 2023, Fall 2023, Winter 2024, Spring 2024, Fall 2024, Winter 2025, Spring 2025, Fall 2025, Winter 2026

SKILLS

Programming & Scripting Languages: Python, C, C++, Java
Web Development: JavaScript, HTML, CSS, React.js, Node.js, Figma, MongoDB, Firebase, AWS
Data Science: R, Pandas, Matplotlib, scikit-learn, NumPy, Data Structures, SQL, NoSQL, Fully Homomorphic Encryption
Machine Learning: TensorFlow, PyTorch, Neural Networks, Computer Vision, Contrastive Learning, Graphical Neural Network
Languages: English (Fluent), Mandarin (Fluent)

PUBLICATIONS & MANUSCRIPTS UNDER REVIEW

- **Liu, X.** (co-author). *Optimal Hyperdimensional Representation for Learning and Cognitive Computation*. **Frontiers on Artificial Intelligence (Accepted)**.
- **Liu, X.** (co-author). *Cross-Modal Event Encoder: Bridging Image–Text Knowledge to Event Streams*. **WACV 2026 (Accepted)**, camera-ready version in preparation.
- **Liu, X.** (first author). *Secure and Efficient Neurosymbolic Reasoning with Controlled Homomorphic Encryption*. **IEEE TAI**, awaiting reviewer response.
- **Liu, X.** (first author). *HyperEncrypt: Homomorphic Hyperdimensional Computing for Efficient and Secure Learning*. **IEEE TAI**, awaiting reviewer response.
- **Liu, X**. (co-author) Geometric Priors for Generalizable World Models via Vector Symbolic Architecture. **NeurIPS NeurReps Workshop 2025 (Accepted).**

RESEARCH EXPERIENCE

BiasLab, UCI **Jun 2024 - Present**
Undergraduate ML Researcher (Advisor: Professor Mohsen Imani)

- Co-authored research papers, spearheading the implementation of hyperdimensional computing (HDC) encoding techniques using PyTorch, and implemented training, testing, and validation pipelines using HDC methods to optimize robustness and accuracy.
- Assisted with CLIP–event modality integration via contrastive learning and attention-rollout visualization, contributing to a +27.4 AUC gain in video anomaly detection and +19.1% accuracy improvement in cutting-edge event-based object recognition.
- Integrated fully homomorphic encryption (FHE) simulation in graphical neural networks (GNN) and Generalized Holographic Reduced Representations (GHRR) in separate projects for secure inference on sensitive video data, yielded a 30% gain in reconstruction quality with bootstrapping to noisy fully homomorphic operations.
- Collaborated with the U.S. Navy to develop custom pose estimation & reasoning model to enable safe UAV landing, reducing casualty rates by 65% in bad weather condition simulations compared to their legacy fixed-pattern optical markers.

BioIntelligence Lab, UCI **Dec 2025 - Present**
Undergraduate ML Researcher (Advisor: Dr. Haleh Alimohamadi)

- Developed a convolutional Graph Neural Network (GNN) to model the physical structure of proteins, representing each amino acid residue as a node to achieve spatial learning and graph prediction.
- Built a structure-aware MIC prediction workflow combining ESMFold peptide structures with SVM-based geometric descriptors for feature extraction.
- Conducted ablation studies comparing curvature-only vs. curvature+structure fusion to assess 3D conformation's role in antimicrobial potency.

Softcom Labs, Cal Poly Pomona **Dec 2020 - Apr 2021**

Student Researcher

- Developed a real-time audio recognition and alarm system for applications in home security, pet monitoring, and emergency response, delivering real-time alerts with a lightweight CNN with Mel Spectrogram input, achieving 95% classification accuracy.
- Engineered a hardware solution with Python, and raspberry Pi for an energy-efficient, near sensor implementation.
- Built a full-stack pipeline with a Firebase backend and Flutter/Android Studio frontend, publishing the app to the Google Play Store with integrated real-time alert notifications.

PROFESSIONAL EXPERIENCE

AdamsFoods, Los Angeles, CA (Frontend, Backend) **Summers 2024 & 2025 (June–Sept.)**

Full-Stack Contractor

- Engineered full-stack features for a wholesale e-commerce platform, implementing React frontend components from Figma designs and AWS S3 backend services for secure user authentication and file uploads.
- Designed and deployed S3 bucket workflows (upload, caching, signed URLs) with Express.js and JWT authentication, ensuring scalable and reliable handling of user documents and images.
- Developed an internal management system for livestock distribution, tracking 300+ stock items and streamlining operations previously managed with handwritten logs.
- Built a real-time interactive map for livestock distribution, improving operational visibility and saving staff 5–7 hours per week over manual tracking.
- Integrated the internal inventory management system with the e-commerce platform to automatically sync product availability, ensuring accurate stock levels for direct-to-consumer sales.

Commit the Change, UCI **Nov 2023 - June 2024**

Full-Stack Developer

- Partnered non-profit org Feeding Pets of the Homeless to provide pro bono software solutions that tracks, displays donation data and authenticates users. Liaised with multiple FPH chapter coordinators to align technical design with operational needs, ensuring the platform met both user and organizational goals.
- Implemented SQL routing and frontend functionalities with React.js, firebase, Figma, and Git in a cross functional, agile environment to deliver a robust, scalable, and end-to-end product.
- Developed fluency with Git version control by managing branches, resolving merge conflicts, and conducting code reviews to maintain code quality and ensure smooth team collaboration.

TEACHING & LEADERSHIP

Certified Learning Assistants Program, UCI **Apr 2025 - Jun 2025**

Learning Assistant

- Served as a Learning Assistant for ICS 33 (Intermediate Python Programming) under Professor Alex Thornton at the Donald Bren School of Information and Computer Sciences, and earned professional Learning Assistant certification through the UNI STU 176: LA Pedagogy training course.
- Provided support to students during lectures as a peer educator in the classroom setting to facilitate active learning; attend weekly lectures and labs, and attend weekly planning meetings with professor and TAs
- Facilitated metacognitive learning; circulate the classroom, assist with students' questions, and ensure that students maintain an understanding of the material

Youth In Action, Orange County Herald Center **Sep 2022 - Jun 2023**

Student Counselor

- Led a team of 8 high school volunteers in a research project on AAPI mental health wellness; guided research progress and strengthened leadership skills; presented findings in the annual OC Herald Mental Wellness Seminar.
- Coordinated biweekly service projects with mental health orgs, food banks, shelters, retirement homes, and nature preserves; managed signups and logistics, built partner relationships, and mentored new student leaders.