YuJia Liang

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Education

National Taiwan Ocean University Keelung, Taiwan

B.S. in Computer Science and Engineering - GPA: 3.6/4.0 *Sep. 2022 – May 2026 (Expected)*

Relevant Courses: Data Structures & Algorithms, Graph Theory Algorithms, Operating Systems, Database Systems, Computer Networks, Machine Learning, Natural Language Processing, Generative AI, Object-Oriented Programming, Cyber Security, Linear Algebra, Discrete Mathematics, Probability Theory

Experience

ITRI (Industrial Technology Research Institute) Jun. 2025 – Aug. 2025

AI Image Recognition Intern, Electronics and Optoelectronics Research Laboratories *Hsinchu, Taiwan*

- Optimized multi-task YOLO model for autonomous driving, improving inference speed while maintaining driving area accuracy and detection recall
- Implemented real-time image streaming and detection result transmission via Ethernet/ROS, processing 30 FPS with sub-50ms latency
- Applied neural network pruning techniques to YOLO models for edge deployment
- Supported research initiatives by reproducing and exploring state-of-the-art (SOTA) models to benchmark performance and identify potential improvements

Research & Projects

Volleyball Performance Analysis System – Senior Capstone Nov. 2024 – Dec. 2025

Python, PyTorch, YOLO, OpenCV, React, TypeScript, FastAPI, Celery, Redis, Docker, pytest Advisor: Prof. Pei-Yi, Ding

- Developed comprehensive volleyball analytics system achieving 94.49% mAP@0.5 for action recognition (5 classes: serve, spike, block, receive, set) and 79.5% ball tracking accuracy
- Architected distributed microservices with FastAPI backend, Celery task queue, and Redis message broker; implemented WebSocket endpoints for real-time analysis progress tracking
- Built multi-model deep learning pipeline: VballNet (U-Net ONNX) for ball tracking at 200+ FPS, YOLOv11m for action detection, YOLOv8+Norfair for player tracking with 87.6% ID consistency
- Developed React/TypeScript frontend with Video.js player, Recharts analytics dashboard, interactive timeline with frame-level seeking, and real-time bounding box overlays
- Implemented trajectory filtering pipeline with velocity-based outlier removal, Gaussian smoothing, and polynomial interpolation; action consolidation algorithm reducing fragmented events by 45%
- Containerized application with Docker Compose orchestrating 5 services; configured GitHub Actions CI/CD with flake8 linting and automated builds
- Wrote comprehensive test suite using pytest with async support, achieving coverage across API endpoints, database operations, and ML inference pipelines

Ghote Notes – AI Note-Taking Application Nov. 2025 – Present

Tauri 2.0, Rust, React 19, TypeScript, Lexical, D3.js, Supabase, PartyKit, Yjs, Vitest, Playwright *Individual Project*

- Built privacy-focused macOS note-taking app using Tauri 2.0 (Rust) with React 19 frontend, featuring vault-based storage with Obsidian-compatible markdown files
- Implemented rich text editing with Facebook's Lexical framework, supporting slash commands, KaTeX math equations, Mermaid diagrams, and bidirectional markdown sync
- Developed interactive knowledge graph using D3.js with wiki-style [[link]] parsing, enabling visual exploration of note relationships
- Built local RAG system using Transformers.js with all-MiniLM-L12-v2 embeddings (384-dim) for semantic search, featuring smart chunking and cosine similarity ranking
- Implemented real-time collaboration via PartyKit WebSocket server with Yjs CRDT for conflict-free concurrent editing and cursor presence
- Integrated Supabase cloud sync with PostgreSQL RPC functions and multi-device vault synchronization
- Achieved 88.75% test coverage with 521 unit tests using Vitest; built comprehensive Tauri API mocks for file system, dialogs, and path utilities

SyncUp – Social Calendar App 2025

Flutter, Dart, Firebase, Google Maps API, Google Gemini API *Individual Project*

- Developed social calendar app with real-time sharing and friend management using Flutter and Firebase

- Implemented location-based event suggestions with Google Maps integration and Firebase Authentication
- Built AI-powered chatbot connected with Google Gemini to intelligently generate schedules and suggest meetup opportunities based on user preferences

Archon RWA Tokenization DApp Jun. 2025

React, TypeScript, Solidity, Hardhat, Ethers.js, Tailwind CSS *Individual Project*

- Developed DeFi platform for Real-World Asset tokenization with role-based access control (ADMIN, VERIFIER, MINTER)
- Implemented smart contracts for identity verification, asset lifecycle management, and dynamic ERC20 token creation
- Built responsive frontend using React and TypeScript, integrating wallet connectivity with MetaMask and account switching

Technical Skills

Programming Languages: Python, Java, C++, JavaScript/TypeScript, Rust, Swift, Dart, SQL
ML/AI: PyTorch, TensorFlow, OpenCV, ONNX Runtime, scikit-learn, NumPy, Pandas, CreateML, Transformers.js, Norfair
Frameworks: React, Flutter, FastAPI, Node.js, SwiftUI, Tauri, Lexical, Celery, Video.js, Recharts, D3.js
DevOps & Tools: Git, Docker, GitHub Actions, pytest, Playwright, Vitest, Redis, PostgreSQL, SQLite, Supabase, Firebase
Languages: Mandarin (Native), English (Fluent TOEFL 110), Japanese (JLPT N3)

Leadership & Activities

Volleyball Department Team Captain 2022 – present

Keelung, Taiwan

NTUFC Kronos Quantitative Reading Club Sep. – Dec. 2025

Hackathon Participant 2022 – present