

Yayun Tan

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EDUCATION

California Polytechnic State University

Master of Science in Computer Science GPA: 3.9

San Luis Obispo, CA

Sep. 2024 – June 2026

Northeastern University

Bachelor of Computer Science and Engineering GPA: 3.8

Shenyang, China

Sep. 2020 – June 2024

PUBLICATIONS & PRESENTATIONS

Tan, Y., Kurfess, F., Delgado, E., Young, C., & Bloom, G. *Post-Hoc Knowledge Grounding for Verifiable Multi-Agent Search and Rescue Decision Support* AAAI-MAKE, San Francisco (2026)

Tan, Y., & Kurfess, F. *A Knowledge Graph Augmented Multi-Agent Framework for SAR* Manuscript in prep.

Leveraging Knowledge Graphs for Real-Time Intelligence in SAR NCJTC Conf., Las Vegas (2025)

AI-Powered SAR: Multi-Agent System with Knowledge Graphs Nxt-AI Conf., San Francisco (2025)

EXPERIENCE

AI for Search & Rescue

Jan 2025 – Present

Team Lead & Graduate Student Researcher (Advisors: Prof. F. Kurfess, P. Kalathas)

Cal Poly

- Directed an 8-person team to design an AI multi-agent framework for search and rescue.
- Implemented A2A/MCP protocols with Autogen and Redis Streams; deployed Dockerized microservices.
- Built a SAR Knowledge Graph in Neo4j to support KG-augmented LLM retrieval for mission planning.
- Analyzed Data Poisoning, Prompt Injection, and Adversarial Examples; designed a robust defense framework.

Automated Human-AI Peer Review System

Sep 2025 – Present

Independent Researcher (Advisor: Prof. F. Kurfess)

Cal Poly

- Architected a dual-model pipeline (GPT-4o/Llama-3) to evaluate human-AI indistinguishability in peer reviews.
- Built a randomization engine for anonymized, double-blind data distribution in a controlled research study.
- Deployed the entire automation workflow via Docker, reducing manual processing time by 95% for the class.

AI for Engineering Education

May 2025 – Present

Graduate Student Researcher (Advisors: Prof. F. Kurfess, P. Kalathas)

Cal Poly

- Selected as Lead Researcher for a funded proposal (\$60k) to integrate Agentic AI into engineering curricula.
- Proposed a Multi-Agent architecture via AutoGen for role-based manufacturing simulations.
- Designed a domain-specific RAG roadmap using Vector Databases to enable retrieval of technical documentation.

RAG-Based Generative AI System

Dec 2023 – June 2024

Research Assistant (Advisor: Prof. Feiliang Ren)

NEU

- Architected a custom weighted hybrid retrieval (BM25+Vector+Cohere) to mitigate model hallucinations.
- Developed the system via LangChain/Gradio, integrating OpenAI/BGE models & FAISS/Chroma/LanceDB.
- Conducted ablation studies, boosting accuracy from 2.85 to 4.2 and factuality to 4.4 out of 5.

NeutronTP: Distributed GNN Training System

May 2023 – Aug 2024

Research Assistant (Advisor: Prof. Yanfeng Zhang)

NEU

- Derived proofs for 'Biased Sampling' convergence to guarantee training stability under minimized communication.
- Designed Computation Push-down and scripts to optimize load balance across Metis/Hash partitioning.
- Achieved 5.29x communication reduction on Reddit/OGBN-products vs. AliGraph and DistDGL baselines.

PROJECTS

IoHT Device Security Assessment

Sep 2024 – Dec 2024

- Verified critical CWE-259/319 vulnerabilities on Baxter pumps via black-box penetration testing.
- Engineered DNS spoofing (Raspberry Pi/Dnsmasq) to simulate gateways and intercept device traffic.
- Evaluated hospital security via surveys, identifying VLAN & PICARL as key IoT defense protocols.

Street Fighter III DRL Agents Benchmark

Jan 2025 – Apr 2025

- Benchmarked Deep RL agents (PPO, A2C, QR-DQN) in high-dimensional action spaces using DIAMBRA.
- Engineered an evaluation pipeline with 50-match rollouts to quantify agent convergence and generalization.
- Optimized PPO hyperparameters to reach Stage 8 averaging 2.76 stages and outperforming in-game AI.

Sarcasm Detection on News Headlines

Sep 2024 – Dec 2024

- Processed 27k Kaggle headlines with full NLP pipeline: normalization, tokenization, and dataset splits.
- Benchmarked TF-IDF + Logistic/SVM against LSTM/BiLSTM (GloVe) and BERT models in PyTorch.
- Fine-tuned bert-base-uncased with Optuna and early stopping, achieving 93.5% test accuracy.

Facial Emotion Recognition

June 2025 – Aug 2025

- Computed Eye/Mouth Aspect Ratios via MediaPipe to detect fatigue cues in real-time video feeds.
- Fine-tuned MobileNetV2 via transfer learning on FER-2013, achieving 70% classification accuracy.
- Fused geometric rules with CNNs to build a robust hybrid pipeline for instant emotion analysis.

Cooking Assistant Web App

Apr 2025 – Jul 2025

- Built a MERN full-stack culinary assistant integrating LLM-based recipe generation and image retrieval APIs.
- Implemented user authentication and guest mode to enhance accessibility and user experience.
- Containerized with Docker and deployed to Google Cloud via a GitHub Actions CI/CD pipeline.

TECHNICAL SKILLS

Machine Learning: PyTorch, TensorFlow, scikit-learn

Databases & Infra: Neo4j, Redis, FAISS, LanceDB, Chroma

Languages: Java, Python, C/C++, Javascript, SQL (Postgres), R

Tools& Cloud: Docker, Git, GCP, AWS, Jupyter, Vim

Libraries: pandas, NumPy, Matplotlib