Thomas Nguyen

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Education

University of California, Irvine Sept 2023 - June 2027
Bachelor of Science in Computer Science *GPA: 3.74*

Work Experience

Software Engineer Intern June 2025 – Sept 2025
SportsStake *Los Angeles, CA*

- Developed production Flutter modules for lineup management, real-time player projections, and trading workflows using Riverpod-based reactive state management.
- Architected a scalable Node.js and PostgreSQL backend deployed on AWS EC2 with Docker containers, Nginx routing, and automated CI/CD pipelines via GitHub Actions.
- Optimized system performance through Redis caching, API batching, and indexed SQL queries, reducing response latency by 40% and improving throughput during peak traffic.

Undergraduate Research Assistant June 2024 – Present
UCI Cognitive & Neural Computation Lab (CCNL) *Irvine, CA*

- Created a behavioral-analysis pipeline aligning timestamps, reaction times, reward outcomes, and sequential choices into structured learning trajectories for contextual bandit experiments.
- Engineered React/TypeScript/Plotly visualization dashboards to surface latent cognitive patterns including exploration–exploitation transitions, uncertainty-driven drift, and strategy switching over thousands of trials.
- Developed an LLM-based centaur agent capable of recursive trial reasoning, reward-updating, and adaptive exploration to compare instability in human and artificial learning under distribution shift.

Machine Learning Research Assistant Oct 2024 – Present
Calit2 – California Institute for Telecommunications and Information Technology *Irvine, CA*

- Designed GRU, LSTM, and dual-encoder surrogate models to approximate spatiotemporal TTES heat propagation, achieving 8,900× faster inference while maintaining physically consistent temperature profiles.
- Built an automated PyTorch training framework with MinMax scaling, sliding-window sequence extraction, synthetic scenario generation, and reproducible CUDA training seeds for controlled model comparison.
- Conducted robustness evaluations on 40+ out-of-distribution thermal profiles, analyzing representational drift, boundary-condition sensitivity, and sequential error propagation in surrogate predictions.

Projects

AI Drift Monitor | *TypeScript, Node.js, Express, PostgreSQL, Python, scikit-learn*

- Built a full-stack monitoring system that detects real-time model drift by comparing live prediction distributions against baseline embeddings using cosine-distance and KL-divergence metrics.
- Developed a Node.js backend with cron-based ingestion pipelines and PostgreSQL storage for versioned model states, inference logs, and drift alerts.
- Implemented a Python microservice for inference auditing and adaptive thresholding, enabling early detection of distribution shift and unstable internal representations in deployed models.

Adaptive Agent Playground | *React, TypeScript, FastAPI, PyTorch, WebSockets*

- Developed an interactive web application allowing users to deploy GRU- and LLM-based agents into configurable environments and observe how reasoning and state representations evolve over time.
- Implemented real-time WebSocket streaming for agent state, reward signals, and policy updates, visualized through React dashboards with dynamic charts and trajectory plots.
- Built a FastAPI backend hosting agent policies, environment logic, and adaptive-learning routines, enabling users to test how small perturbations in feedback or uncertainty produce divergent agent behavior.

Technical Skills

Relevant Coursework: Data Structures and Algorithms, Object-Oriented Design, Discrete Mathematics, Probability Theory, Statistics, Computer Architecture, Web Development, Operating Systems
Languages/Skills: Python, Java, C++, JavaScript, TypeScript, SQL, HTML/CSS
Frameworks: React, Node.js, Express, Flask, Flutter, Docker, Firebase, AWS, Redis