

ZACHARY RYAN LEE

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EDUCATION

University of Illinois Urbana-Champaign

Champaign, IL

BS in Computer Science & Statistics, Minors in Math, Data Science & Game Design GPA: 3.9 | Expected: May 2027

EXPERIENCE

Software Engineer Intern

Jun. 2025 – Aug. 2025

Air Force Research Laboratory

Rome, NY

- Engineered a Graph Attention Network + Deep Q-Network (GAT-DQN) RL system for adversarial pathfinding on static graphs, delivered 95% optimal paths and 87% adversary deception using PyTorch and PyTorch Geometric.
- Built cross-suite automated benchmarks across search, GNNs, and differentiable planners and flagged feature-transform attack vulnerabilities plus generalization and latency trends.

Software Engineer

Feb. 2025 – May 2025

Companions Journeying Together

Chicago, IL

- Improved audio story delivery serving 2,000+ families by implementing PHP/CodeIgniter 4 async job queues and checksum validation on AWS S3 with MySQL, cut latency by 52%, reaching 99% delivery success.
- Collaborated with a team of volunteer developers to add new features, resolve bugs, and maintain the system, ensuring seamless audio story delivery for 100+ daily users via an innovative online platform.

Founding Engineer

Nov. 2024 – Present

Capa

Remote, USA

- Integrated the Sysolution Xixun Java SDK with a Java/Spring Boot service on AWS EC2 behind Nginx, streaming GPS from 50+ LED controllers into MySQL and broadcasting over WebSocket maintained 99.9% uptime.
- Built from scratch a Google Maps SPA using ES6 modules, Fetch API, and client-side caching to render GeoJSON layers with clustering, geofences, replay, and alerts, p95 locate <2 s and 70% fewer manual check-ins.

AI Researcher

May 2025 – Present

Algoverse

Berkeley, CA

- Built FIRM: Pinpoint Tuning + Debiased Steering Vectors, with a Bias Diagnostic Pass localizing biased heads/layers via activation patching + causal tracing in TransformerLens, and circuits visualized in CircuitsVis.
- Evaluated on 10 models across 10 bias tasks totaling 50k samples, achieving 47.6% mean bias reduction (up to 78.8%) with accuracy preserved. Manuscript under review at AAAI and EMNLP.

Research Assistant

Sep. 2024 – Present

University of Illinois Urbana-Champaign, Dr. Daniel Kang

Champaign, IL

- Built a human-in-the-loop LLM annotation pipeline with Monte Carlo sampling (importance + control variates), confidence triage, and SQL generation, yielding valid CIs, 92% lower error, and $2.57\times$ fewer labels.
- Replicated then improved implicit-hate/bias baselines using Hugging Face Transformers and OpenAI API with NumPy/scikit-learn, tuning NER + entity resolution, adding calibration, and lifting noisy-text accuracy/F1.

Machine Learning Intern

Jul. 2024 – Feb. 2025

Cebu Pacific

Remote, USA

- Built a 300K-record, 50-feature lightning dataset and shipped stacked Gradient Boosting + Random Forest forecasts for 400+ daily flights, raising scraper/DB throughput +153% and real-time integrity.

PROJECTS

Project Echoridge | Python, PostgreSQL, Redis, Playwright, Docker, Pydantic, RapidFuzz

June 2025 – Present

- Built PMF Deep Researcher, a production 12 stage pipeline that discovers and enriches companies across regions.
- Enforces per provider budgets and rate limits, UPSERTs evidence tracked records in PostgreSQL, and ships feature complete bundles and run reports in a Docker stack with Redis and structured logging.

TECHNICAL SKILLS

Languages: Python, C++, Java, JavaScript/TypeScript, C#, Kotlin, PHP, Bash, SQL, HTML/CSS, Git

Databases & Tools: MySQL, PostgreSQL, Linux, Git, Docker, Nginx, AWS (EC2, S3, RDS), Firebase, Spring Boot, CodeIgniter 4, REST APIs, WebSockets

AI/ML: PyTorch, PyTorch Geometric, TensorFlow, scikit-learn, XGBoost, LightGBM, NumPy, Pandas, OpenCV, Hugging Face Transformers