Matthew (Linghe) Zhang

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Education

University of California, Santa Barbara Goleta, CA
B.S. Computer Science & B.S. Statistics and Data Science Aug. 2023 – May 2027

- Major GPA: 3.98/4.00
- Relevant Coursework Data Structures and Algorithms, Operating Systems, Computer Networks, Computer Architecture, Machine Learning, Artificial Intelligence, Computer Vision, Probability, and Distributed Systems

Experience

Lucid Motors | *SWE, In-Vehicle AI Assistant Engineer* June 2026 – Present

- Developed an automated in-vehicle agent testing framework in Kotlin, validating the full pipeline from voice activation through network hops to vehicle signal execution, reducing QA testing time by 80%
- Engineered multi-agent testing to simulate realistic customer behavior, and validate assistant behavior through deterministic function checks, metric scoring, and semantic evaluation, increasing new failure discovery by 4×

MOMENT Lab | *Undergraduate Researcher* July 2025 – April 2026

- Second-authored *DualPI2 for Mahimahi* (ACM SIGCOMM CCR), introducing an L4S-capable DualPI2 emulator and a statistically grounded methodology for improving fidelity to kernel space behavior
- Quantified Mahimahi DualPI2 fidelity against the Linux kernel implementation using time-series analysis and robust nonparametric tests, identifying statistically significant gaps in packet timing and shaping
- Engineered a concurrent network experimentation system using Linux namespaces, traffic-control, and virtual-networking primitives, enabling parallel collection while being under 5% cross-run variance

Mayer Lab | *Founding Software Engineer* July 2025 – June 2026

- Sole-developed a U.S. Navy-funded classroom research platform supporting daily video-based HCI experiments across UCSB labs, with AutoGen multi-agent systems simulating student audiences (Award UC-2026-822-1)
- Built a video delivery platform supporting 30+ concurrent streams across simultaneous daily experiments, benchmarked at 55% lower startup latency and 75% lower compute cost than S3 and CloudFront
- Engineered real-time synchronization system including horizontally scaled WebSocket servers using Redis Pub/Sub and automated failover, maintaining <100 ms p95 playback drift with sub-second recovery from server failures

Research Projects

Agentic Network Experimentation | *System and Networking Lab* May 2026 – Present

- Developed an automated multi-application traffic generator for the California Public Utilities Commission (CPUC) to simulate realistic household Internet usage from natural-language queries
- Developed a centralized observability system tracing execution order, latency, and user intent across multiple microservices and LangGraph workflows, reducing mean time to root cause by 8×.

Semantic Gaussian Scene Editing | *Vision Lab* November 2025 – Present

- Engineered a 3D Gaussian Splatting cleanup pipeline using geometric point-cloud constraints and lineage-based pruning, matching segmentation-based isolation quality; preprint in preparation
- Developed and evaluated a ReAct agent for autonomous 3D scene cleanup, measuring how episodic memory, learned Gaussian features, and tool/action-space design affect editing performance

Awards

UCSB Hackathon (Aryan.AI — First place, 2025) – Built LLM vision scraper achieving 96% accuracy on 20 sites
UCSB Datathon (Groq.AI — First Place, 2025) – Built a multi-agent pandemic simulator across 20 agents
Unwrap.AI (Winner, 2025) – Developed Qwen Video Understanding Pipeline for Ad Generation

Skills

Infra: AWS (EC2, ALB, VPC, S3, RDS, ElastiCache, ECR, CloudWatch, IAM), Kafka, RabbitMQ, Cassandra, Spark
Languages: TypeScript, Kotln, Python, C++, Java, JavaScript, SQL, R, Bash, GOlang
Tools: React, Three.js, Django, OpenCV, Docker, Swagger, Celery, Nginx, Storybook, Playwright, Redis
AI: NumPy, PyTorch, CNNs, R-CNNs, transformers, RAG, reinforcement learning, prompt engineering