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 – June 2027

- Major GPA: 3.98/4.00 — Cumulative GPA: 3.95/4.00
- Relevant Coursework DS&A, Operating Systems, Computer Networks, Computer Architecture, Machine Learning, Artificial Intelligence, Computer Vision, Distributed Systems, Computer Securities, Probability, Stochastics

Experience

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

- Built a Kotlin testing framework deployed in-vehicle to validate agent behavior across voice activation, WebRTC transport, backend services, and vehicle-signal execution, reducing in-vehicle testing time by 80%
- Built stateful agents with structured memory to simulate diverse personas across user, and environment conditions, using failure memory and clustering to refine generation and uncover 4× more failures than manual testing
- Engineered a multi-agent validation framework using deterministic checks, metric scoring, and semantic validation across new vehicle builds and conditions, matching manual precision and recall

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
- Engineered an automated concurrent network experimentation system using Linux network namespaces, routing, traffic control, and TUN, enabling parallel collection while maintaining over 99.99% valid experiment completion
- Statistically quantified fidelity gaps between Mahimahi's DualPI2 emulator and Linux kernel implementation using packet-level ECN, queue, and throughput time-series

Mayer Lab | *Full-stack Software Engineer* July 2025 – June 2026

- Sole-developed a U.S. Navy-funded classroom research platform powering daily behavioral studies across UCSB labs, simulating realistic classrooms with real-time agents for human-subject research (Award UC-2026-822-1)
- Built a distributed video-delivery system with custom ABR and edge caching across private VPS nodes, supporting 30+ concurrent streams per room in production with 55% lower startup latency than previous S3/CloudFront
- Engineered a horizontally scaled video synchronization system with Redis Pub/Sub and automated client/server failover, supporting 400+ concurrent clients with 99.9% of playback drift under 200 ms

Research Projects

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

- Decoupled a single-container agent architecture by separating orchestration, sandboxed network environments, agent services, and tool execution, improving resilience to network failures by 5×
- Built a Kubernetes-based orchestration system for agents running PyAutoGUI tasks on dedicated VMs with configured bottleneck queues, reproducing home-network conditions with under 5% cross-run variance

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 computer-use agent for autonomous 3D Gaussian Splatting scene cleanup, evaluated action-space design and memory affect cleaning performance; built a custom interface.

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

Languages: Python, TypeScript, JavaScript, Kotlin, C++, Java, SQL, Go, Bash
Frameworks: React, Django, Flask, Django Channels, Three.js, Celery, Playwright, OpenAI Agent SDK, MCP server
Infrastructure: Docker, Docker Compose, Kubernetes, AWS (EC2, ECS, S3), Redis, Nginx, MySQL, Linux, Sockets
AI & Vision: PyTorch, OpenCV, NumPy, LangGraph, RAG, 3D Gaussian Splatting, LLM Agents, Colmaps, SIFT