Liam Mecklenburg

liam-meck.com

Education

Clemson University — Clemson, SC
Bachelor's in Computer Science, Minor in Entrepreneurship; GPA: 3.31/4.00 — *Expected Dec. 2026*

Experience

Manufacturing Digitization Co-op — May 2026 – Aug. 2026
BMW Manufacturing — *Greer, SC*

- Audited 152 shop-floor computer terminals across three manufacturing areas, verifying them against a separate tracking system and building a dataset that corrected location errors and flagged high-risk hardware
- Built a Power BI dashboard tracking lost, found, and totaled test equipment across a dataset of 5,000+ assets, enabling leadership to quantify losses, monitor recovery, and establish KPIs
- Migrated a legacy internal app receiving ∼140 daily submissions to a centralized platform, preserving core features
- Partnered on a plant-wide downtime initiative, estimated at $22,000–$50,000 per minute based on plant-staff input; evaluated four solution paths and delivered a dashboard mockup and handoff documentation

Undergraduate Researcher — Jan. 2025 – Present
WATT AI, Clemson University — *Clemson, SC*

- Built a RAG pipeline using open-source LLMs (Llama 3 8B) and a Chroma vector database to extract themes and insights from 73,000+ self-reports submitted by frontline hospital staff
- Cut query response time 58% (20.4s to 8.5s) by moving LLM inference to vLLM on Clemson's Palmetto HPC
- Developed a full-stack web application (Python, HTML, JavaScript, CSS, SQLite) with user authentication and chat history, enabling non-technical users to query patient reports in natural language

Independent AI Safety Researcher — Nov. 2024 – Mar. 2025
Anthropic AI Safety Bug Bounty Program — *Remote*

- Selected for Anthropic's AI safety bug bounty program, red-teaming frontier language models
- Designed and executed adversarial tests targeting model security and response-filtering safeguards
- Documented findings in detailed reports to support model safety improvements

Software Tester — May 2024 – Feb. 2025
Eleos Technologies — *Greenville, SC*

- Executed 2,000+ test cases across Android and iOS apps serving the United States' largest trucking carrier
- Worked alongside software engineers to improve user experience and increase customer retention
- Developed test plans for new features targeting 99.9% edge-case coverage

Projects

Multimodal Transformers for Molecular Connectivity Prediction — Sep. 2026 – Present
Clemson Creative Inquiry Research Project

- Designed and trained encoder–decoder and decoder-only Transformers to predict molecular connectivity (SMILES) from IR, Raman, and C/O XANES spectra for 107,126 QM9 molecules
- Demonstrated a 7.9–18.3 point top-1 accuracy gain over a vibrational-only baseline; on a scaffold split testing unseen molecular frameworks, accuracy rose from 33% to 52%
- Found that carbon-edge XANES alone captures 86–90% of the gain from both XANES edges
- Selected for an oral presentation at APS meeting, Kennesaw, GA (Nov. 2026); publication in progress

Homelab Infrastructure — Jun. 2025 – Present
Docker, Ubuntu, TrueNAS, Tailscale, Caddy, Ollama

- Operate 27 Docker containers on an 8-core Ubuntu server with 23 TB of TrueNAS/NAS storage and Tailscale access
- Serve Gemma 4 locally on an RTX 3060 Ti (8 GB VRAM) through Ollama
- Built monitoring for 22 services with Uptime Kuma and a custom nginx/Python dashboard with 4 data pollers
- Automated 6 cron jobs and weekly config backups
- Restored a 27-container stack after a NAS outage by diagnosing why Docker aborted container starts on failed bind mounts

Mavericks to the Moon — Jan. 2021 – Feb. 2022
Greenville, SC

- Founded and led an 8-person team that secured sponsorship from investor Mark Cuban to launch a weather balloon
- Soldered 20 PCBs for the onboard flight computer, logging temperature, pressure, telemetry, humidity, and GPS
- Delivered promotional content for the Dallas Mavericks and atmospheric data analysis to fulfill sponsor commitments

Technical Skills

Programming Languages: C++, Python, SQL, JavaScript, HTML/CSS
Tools & Frameworks: Git, NumPy, Pandas, PyTorch, RDKit, LangChain, Slurm, vLLM, ChromaDB, Docker, Power BI
Concepts: LLMs, RAG, Transformer Models, NLP, Database Design, Software Testing, UI/UX Design, Agile, Consulting