

Ayman Mahfuz

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EDUCATION

The University of Texas at Austin

Bachelor of Science in Computer Science

Austin, TX

Aug 2023 - May 2027

- **Concentration:** AI and ML | **GPA:** 3.5/4.0
- **Courses:** HPC, NLP, Visual Generative Computing, Energy Efficient Computing

SKILLS

Languages: Python, C++, C, JavaScript, TypeScript, SQL, Java, HTML/CSS

Systems/Tools: System Design, Distributed Systems, Multi-threading, Concurrency, Docker, Linux, Git, AWS, GCP

Frameworks/Libraries: React.js, Flask, Django, FastAPI, REST APIs, OAuth/JWT, Pandas, Numpy

ML/AI: PyTorch, TensorFlow, Transformers, LLMs, Image Generation, Reinforcement Learning (PPO, MAPPO)

EXPERIENCE

Arm

May 2025 – Present

ML Research Engineer Intern

- Engineered a modular, high-performance, ML-driven Bayesian optimization platform (Python) automating 10,000+ hours of CPU/memory stress tests; achieved 99.8th-percentile coverage using less than 1% of test cases and accelerated failure discovery.
- Presented tool to SVP and directors, collaborated across firmware/validation teams, authored 1,400+ lines of documentation, and conducted code reviews to ensure reliability, maintainability, and adoption of the platform.

Texas Robotics, UTCS AI Lab

Jan 2025 – Present

Undergraduate Research Assistant

- Optimized a 400K+ LOC C++ simulator and training stack; cutting RL training time 67% via profiling, memory tuning, and early-termination heuristics.
- Scaled curriculum training to 5M+ episodes with reproducible GPU configs and CI/CD testing pipelines; tuned sim-to-real parameters to boost on-robot reliability.
- Deployed hierarchical multi-agent policies (dribble, pass, shoot, defend) on NAO robots, securing a 3rd place finish globally at RoboCup 2025 SPL.

The University of Texas at Austin - Center for Media Engagement

Aug 2023 – May 2025

Software Engineer, Undergraduate Research Assistant

- Designed from the ground up a scalable full-stack research platform: three React web application games tied to a Flask backend with a round-robin game assigner, Firebase logging of every participant action, and dashboards for rapid data analysis; supported 1,000+ participants with 99.99% uptime.
- Engineered ETL pipelines and cron-based scrapers that ingested and organized a 250M+ row dataset into GCP BigQuery, enabling efficient queries and domain/content-level analysis.
- Built and fine-tuned BERT/LLM classifiers (clickbait, story detection, sentiment, entity recognition) and deployed them behind Flask REST APIs with logging/error handling for reliable study use.

Lockheed Martin

Jun 2022 – Oct 2022

Software Engineering Intern

- Built JavaScript tooling to deduplicate asset records in internal CRM systems, improving data integrity and streamlining reporting across departments.

PROJECTS

Helm — AI-Native Product Management Platform | *Next.js, FastAPI, PostgreSQL, Anthropic/OpenAI, Railway, Vercel*

- Architected Helm's AI core: built a streaming, tool-using agent backend with cross-provider model abstraction (OpenAI + Anthropic programmatic tool-calling), plus hybrid retrieval (pgvector + Postgres FTS) across tickets, meetings, docs, and GitHub context.
- Built and operated the multi-tenant production platform end-to-end, integrating 8+ systems (Slack, GitHub, Notion, Jira, Stripe, Resend) and implementing bidirectional Linear sync with field-level 3-way conflict resolution

Modern Transformer LLM with RLHF Alignment | *Pytorch*

- Built decoder-only LLM from scratch with state-of-the-art architecture (RoPE, RMSNorm, SwiGLU, attention sinks); developed Direct Preference Optimization (DPO) alignment pipeline; optimized training for H100 GPU

Attention-Based Image Gen Model | *Pytorch*

- Built DDPM from scratch with transformer attention layers and U-Net backbone; implemented both DDPM and DDIM samplers achieving 20x speedup while maintaining generation quality on CIFAR; trained end-to-end noise prediction and denoising pipeline