Ayman Mahfuz

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Education

The University of Texas at Austin — Austin, TX

Bachelor of Science in Computer Science, Concentration in AI and ML — *Aug 2023 - May 2027*

- **Courses:** HPC, NLP, Visual Generative Computing, Linear Algebra, Calculus, Probability

Experience

ML Research Engineer (Former Intern) — May 2025 – Present

Arm

- Engineered a modular ML-driven validation platform (Python) automating 10,000+ hours of CPU/memory stress tests; achieved 99.8th-percentile coverage using less than 1% of test cases.
- Designed a plug-and-play Bayesian optimization service for test configuration selection; accelerated failure discovery and reduced manual validation workload by orders of magnitude.
- Collaborated across firmware/validation teams, authored 1,400+ lines of documentation, and conducted code reviews to ensure reliability, maintainability, and adoption of the platform.

Research Assistant — Jan 2025 – Present

University of Texas at Austin — AI Lab, Texas Robotics

- Optimized a 400K+ LOC C++ simulator and training stack; reduced RL training time 70% via profiling, memory tuning, and early-termination heuristics.
- Scaled training to 5M+ episodes; authored robust training/CI scripts and reproducible configs for GPU runs.
- Deployed 7v7 robot policies (dribble, pass, shoot) in competition; placed 3rd globally (RoboCup 2025 SPL).
- Tuned physics and sim-to-real parameters to improve on-robot reliability; contributed fixes and documentation to shared C++ modules.

Software Engineer, Research Assistant — Aug 2023 – May 2025

The University of Texas at Austin - Center for Media Engagement

- Designed from the ground up a full-stack research platform: three React 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.

Research Assistant — Aug 2023 – Jan 2025

The University of Texas at Austin - Oden Institute for Computational Engineering and Sciences

- Engineered a high-throughput 3D MRI segmentation pipeline on TACC H100 GPUs with Apptainer/SLURM; improved Dice score +12% while maintaining throughput.
- Benchmarked CNN/Transformer variants across 1,000+ scans; resolved mixed-precision, I/O, and memory bottlenecks; wrote reproducible training scripts and configs.

Projects

Inkwell: Youtube for Books | *Django, React, PostgreSQL, Docker*

- Founded and built "Inkwell," a scalable React/Django platform for book-sharing, featuring 50+ REST endpoints, JWT auth, intelligent search, and AWS-integrated deployment.

InReach | *React, Flask, OpenAI*

- Built a full-stack platform (React + Flask) leveraging LLMs (GPT APIs) to automate cold outreach—generating personalized, intent-driven emails sent via Gmail-authenticated bulk delivery; used by 200+ users.

CodeXRay | *React, FastAPI, Docker, OpenAI*

- Built full-stack static analysis platform processing 1M+ line codebases with AST parsing, NetworkX graphs, and GPT-4 integration to generate interactive dependency visualizations for faster codebase onboarding.

Skills

Languages: Python, C++, C, JavaScript, SQL, Java, HTML/CSS
Systems/Tools: BigQuery, Pandas, Docker, Linux, Git, AWS, GCP, SLURM, Apptainer
Frameworks/Libraries: React.js, Flask, Django, FastAPI, REST APIs, OAuth/JWT
ML/AI: PyTorch, TensorFlow, Transformers, RL