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

- Independently pitched and defined an ML-guided hardware validation project under complete ambiguity; built an initial demo, iterated rapidly, and scaled it into a deployed system now adopted by validation teams.
- Invented a Bayesian Optimization test selection pipeline achieving 99.8th-percentile coverage with less than 1% of cases, automating 10,000+ hours of CPU/memory stress workloads.
- Delivered research-grade experiments and engineering artifacts: reproducible configs, monitoring, and documentation. Recognized at the executive level for solving a 20+ year open bottleneck in validation.

Research Assistant Jan 2025 – Present

University of Texas at Austin — AI Lab, Texas Robotics

- Developed multi-agent RL policies for embodied NAO robots, covering dribbling, passing, and shooting.
- Designed and iterated on reward functions, curricula, and hierarchical control; scaled training to 5M+ episodes with reproducible pipelines.
- Achieved 3rd place globally at RoboCup 2025 SPL, demonstrating reliable sim-to-real transfer from C++ simulator to physical robots.
- Profiled and optimized GPU usage and simulator physics and C++ codebase (400K+ LOC), cutting training time by 67%.

Software Engineer, Research Assistant Aug 2023 – May 2025

The University of Texas at Austin - Center for Media Engagement

- Self-directed research project: architected and deployed a full-stack platform (React/Flask/Firebase) with interactive experiments and MTurk integration; iterated design until achieving 99.99% uptime with 1,000+ participants.
- Designed ETL + ML pipeline for 200M+ news articles, enabling experimentation on clickbait detection, entity recognition, and sentiment classification; fine-tuned BERT/LLMs to 99% accuracy.

Research Assistant Aug 2023 – Jan 2025

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

- Proposed and executed a high-throughput 3D MRI segmentation pipeline on TACC's H100 GPU cluster; designed training configs, optimized infrastructure, and improved Dice score by +12% over baselines.
- Benchmarked CNNs, Transformers, and hybrid architectures across 1,000+ MRI scans; debugged GPU memory, I/O, and mixed-precision bottlenecks to enable scalable, reproducible training.

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
ML/AI: PyTorch,TensorFlow, Transformers/LLMs (HF), RL (PPO), model training pipelines, deep learning
Systems/Tools: BigQuery, Pandas, Docker, Linux, Git, AWS, GCP, SLURM, Apptainer, Weights and Biases
Frameworks/Libraries: React.js, Flask, Django, FastAPI, REST APIs, OAuth/JWT