

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 proposed and shipped the **industry's first** ML-guided hardware validation framework, solving a 20+ year-old problem by efficiently surfacing worst-case CPU and memory stress-tests.
- Invented a novel Bayesian Optimization pipeline to achieve 99.8th-percentile hardware stress coverage using less than 1% of test cases, automating 10,000+ hours of random validation workload using deep learning.
- Secured **executive-level** recognition for creating a generalizable, safety-first validation pipeline now deployed at ARM to proactively detect hardware bottlenecks before reaching production.
- Converted to part-time research engineer role post-internship to continue R&D contributions.

Research Assistant

Jan 2025 – Present

University of Texas at Austin — AI Lab, Texas Robotics

- Placed **3rd globally** at RoboCup 2025 (Standard Platform League), deploying multi-agent RL policies for 7v7 NAO robot soccer in high-stakes international competition.
- Trained end-to-end policies for dribbling, passing, defending, and shooting using curriculum learning, hierarchical control, and distillation—scaling to **5M+ episodes** in a full sim-to-real pipeline.
- Cut RL training time by **70%** through aggressive GPU optimization, simulator tuning, and early-stall termination; optimized 400K+ lines of C++ and tuned physics for real-world fidelity.

Software Engineer, Research Assistant

Aug 2023 – May 2025

The University of Texas at Austin - Center for Media Engagement

- Engineered scalable ETL pipelines for 200M+ news articles, leveraging APIs, sitemaps, Pandas, and BigQuery; delivered real-time monitoring dashboards with Python and SQL.
- Fine-tuned BERT machine learning models for clickbait detection, story classification, entity recognition, and sentiment analysis, achieving up to 99% accuracy.
- Independently designed and deployed a full-stack research platform (React, Flask, Firebase) with 3 interactive games, MTurk integration, and 99.99% uptime for 1,000+ participants.

Research Assistant

Aug 2023 – Jan 2025

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

- Developed a high-throughput 3D pancreas MRI segmentation pipeline using TACC's H100 GPUs, Apptainer containers, and SLURM scheduling; improved Dice score by 12%, matching state-of-the-art results.
- Benchmarked CNNs, transformers, and hybrids (e.g., PanSegNet) on 1000+ MRI scans, resolving GPU memory, I/O, and mixed precision issues to enable scalable 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) that automates cold outreach for jobs—leveraging GPT APIs to generate personalized emails based on resume and intent, sent via Gmail-authenticated bulk delivery, with 200+ users.

CodeXRray | *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

ML/AI: Deep Learning, Reinforcement Learning, Multi-Agent Systems, Computer Vision, Transformers, CUDA

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

Systems/Tools: Distributed Computing, HPC, Docker, Git, AWS, GCP, SLURM, Apptainer

Frameworks/Libraries: PyTorch, TensorFlow, HuggingFace, Django, Flask, FastAPI, React.js, scikit-learn, Pandas