Ayman Mahfuz

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EDUCATION

The University of Texas at Austin, Austin, TX *May 2027*

B.S. in Computer Science & Mathematics, Concentration in Machine Learning & AI

Courses: Data Structures, Computer Systems, Algorithms, Linear Algebra, Probability, High Performance Computing

EXPERIENCE

The University of Texas at Austin – Artificial Intelligence Lab, Texas Robotics *Jan 2025 – Pres*

Research Assistant

- Leading development of multiagent Reinforcement Learning models for NAO robot soccer, optimizing coordination across 5 physical robots, with models trained on 100,000+ simulation episodes before real-world transfer.
- Optimizing real-time decision-making in a 400K+ line C++ robotics codebase, targeting sub-50ms reaction times and 5x faster state-space processing for real-time distributed AI coordination.

The Sunwater Institute *Jan 2025 – Pres*

Data Engineer Intern

- Building high-performance data pipelines processing 500K+ legal documents for Legis-1 database, achieving sub-second query latency and 99.9% data processing accuracy.
- Developing production LLM system targeting daily analysis of 1000+ legislative documents, with RAG-enhanced generation achieving 85%+ human-rated accuracy on policy insights.

The University of Texas at Austin - Center for Media Engagement *Aug 2023 – Pres*

Software Engineer, Research Assistant

- Engineered large-scale data pipelines to scrape, preprocess, and upload 50M+ news articles and 70M+ comments to BigQuery, using APIs, sitemaps, and Pandas, while developing dashboards with Python and SQL for real-time monitoring.
- Led machine learning initiatives by fine-tuning multiple BERT models for key NLP tasks—including clickbait detection, story identification, entity recognition, and sentiment analysis—achieving up to 99% accuracy.
- Designed & deployed a research platform independently with React, Flask, and Firebase, featuring 3 interactive games, MTurk integration, real-time analytics tracking 15+ metrics, and 99.99% uptime, serving 1,000+ participants.

The University of Texas at Austin – Oden Institute for Computational Engineering and Sciences *Aug 2023 – Jan 2025*

Machine Learning Engineer, Research Assistant

- Trained and evaluated transformer -enhanced vision models (TransUNet, MedSAM2) for 3D MRI segmentation on TACC's Lonestar6 supercomputer, leveraging Apptainer containerization, mixed precision training, H100 GPUs and HPC optimizations to achieve 11% increase in Dice score, matching state-of-the-art model performance.
- Developed real-time training monitoring scripts to track loss curves, step efficiency, and model convergence, enabling rapid hyperparameter tuning and comparative model evaluation, while resolving I/O bottlenecks and HPC memory constraints.

Lockheed Martin *Jun 2022 – Oct 2022*

Software Engineer Intern

- Developed internal software systems and enhanced CRM workflows and configuration databases with JavaScript, improving operational efficiency by 30%

PROJECTS

Inkwell: YouTube for Books

- Founded and developed a full-stack book-sharing platform using React, Django, & PostgreSQL, featuring a RESTful API with 50+ endpoints, JWT authentication, & intelligent search to enhance user experience
- Optimized performance & scalability with efficient database schemas, data loading, & deployment via Docker, CI/CD pipelines, & AWS S3 integration

Leetcode Matchmaker

- Developed a web application that compares 2000+ LeetCode problems, finding and displaying similar problems using cosine-similarity on problem vectors, leveraging machine learning techniques and built with React and Flask

SKILLS

Programming & Libraries: Python, JavaScript, Java, C, C++, SQL, HTML/CSS, PHP, ARM64, Ruby,

Frameworks & Libraries: React.js, Flask, Django, Pandas, NumPy, Scikit-learn, PostgreSQL, CUDA, PyTorch, TensorFlow, Autogen

Tools & Platforms: IntelliJ, VSCode, Eclipse, Google Cloud Platform (GCP), Jupyter Notebooks, Git, AWS, TACC, HPC