Ayman Mahfuz

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EDUCATION

The University of Texas at Austin, Austin, TX   *August 2023 – 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
- Developing multiagent RL models for NAO robot soccer, applying deep reinforcement learning (DRL) and supervised learning (SL) to train agents in 2D & 3D simulations, then optimizing sim-to-real transfer for deployment on physical robots
- Optimizing real-time decision-making in a 400K+ line C++ robotics codebase, improving distributed AI coordination for millisecond-level reactions while handling low-latency constraints & real-time system scheduling.

The Sunwater Institute   *Jan 2025 – Pres*
Data Engineer Intern
- Building high-performance data pipelines for Legis-1, a legislative database with millions of legal documents, optimizing retrieval speed, storage efficiency, and AI-readiness for structured data.
- Developing LLM pipelines to power AI-generated news and policy analysis, leveraging retrieval-augmented generation (RAG), embeddings, and scalable document processing across 500K+ records.

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 ViT-enhanced models (TransUNet, MedSAM2) for 3D MRI segmentation on TACC's Lonestar6 supercomputer (H100 GPUs), leveraging Apptainer containerization, mixed precision training, and HPC optimizations to achieve ~0.82 Dice score for Dell Medical School.
- 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, Node.js, Flask, Django, Pandas, NumPy, Scikit-learn, PostgreSQL, CUDA, PyTorch, TensorFlow
Tools & Platforms: IntelliJ, VSCode, Eclipse, GCP, Jupyter Notebooks, Git, AWS, TACC, HPC