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, Statistics, High Performance Computing

EXPERIENCE

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

Software Engineer, Research Assistant

- Engineered large-scale robust Python pipelines for scraping, preprocessing, & uploading 50M+ news articles & 70M+ comments to BigQuery, employing APIs, sitemaps, HTML parsing, Pandas, & NumPy
- Developed dynamic dashboards using Python, SQL, Matplotlib, & Looker Studio to track data collection progress & fill gaps
- Led machine learning initiatives, fine-tuning a DistilBERT model (Hugging Face) to classify news headlines & comments with 99% accuracy & high precision, recall, & F1 score
- Conducted advanced research on clickbait trends & personal stories in comments, leveraging NLP, CUDA & extensive data analysis to derive insights for upcoming publications on misinformation
- Designed and deployed a research platform with React/Tailwind, Flask, and Firebase, featuring 3 interactive games, real-time analytics tracking 15+ metrics, MTurk integration, and 99.99% uptime serving 1,000+ participants

The University of Texas at Austin – Dell Medical School *Aug 2023 – Jan 2025*

Machine Learning Engineer, Research Assistant

- Architected a high-performance HPC pipeline on TACC using Apptainer containers, PaNSegNet, and ViT-enhanced models (e.g., TransUNet, MedSAM2) to streamline 3D MRI segmentation of pancreas, boosting pancreas Dice scores to ~0.82 while reducing training runtime by 90%.
- Spearheaded large-scale data engineering workflows (patch-based 3D augmentation, GPU-accelerated preprocessing) and resolved advanced system integration challenges (shape mismatch, HPC I/O bottlenecks), enhancing model robustness, interpretability, deployment for deep-learning-driven medical imaging.

The University of Texas at Austin – School of Information *Feb 2024 – Jan 2025*

Machine Learning Engineer, Research Assistant

- Conducted research on diagnostic reasoning in multiagent systems for medical queries, assessing consistency and accuracy
- Developed Python scripts using Autogen and GPT-4 API to test if LLMs reason reliably across varied and misleading contexts

Lockheed Martin *Jun 2022 – Oct 2022*

Software Engineer Intern

- Optimized CRM workflows & refined Configuration Database through JavaScript & RPA integration
- Enhanced data accuracy by 25% & streamlined internal processes, resulting in 30% improved operational efficiency

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, utlized React for the frontend, & Flask for the backend

Pintos Operating System (C)

- Implemented low-level, core OS components in C for Pintos, including a priority scheduler, user programs, virtual memory, and a filesystem; achieved 100% test coverage for synchronization primitives, system calls, and memory management

SKILLS

Programming & Libraries: Python, Java, C, JavaScript, HTML/CSS, SQL, PHP, Node.js, React.js, C++, Flask, Django, Pandas, NumPy, Scikit-learn, Ruby, ARM64, Postgresql, CUDA

Tools: IntelliJ, VSCode, Eclipse, GCP, Jupyter Notebooks, Git, AWS, TACC, HPC