Salma Aly

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Education

University of Windsor – PhD in Computer Science — Sep 2023 – Present
The American University in Cairo – MS in Computer Science — Jun 2022
Future University in Egypt – BS.c. in Computer Science. GPA:4.0 — Aug 2018

Selected Research Contributions

- Aly, S. R., Kobti, Z. (ICLR 2027) Consensus Judge: Fine-Tuned Model for LLM Code Evaluation. (In Preparation).
- Aly, S. R., Kobti, Z. (ICSE 2027) ICT-Eval: Cost-Effective Reference-Free Correctness Prediction for LLM-Generated Code (Under Review).
- Aly, S. R. (TOSEM 2026) Correct, According to What? A Systematic Mapping of Evaluation Frameworks, Benchmarks, and Metrics for LLM-Generated Code (Under Review). Paper and Replication Package Link Here
- Aly, S. R., Saad, S., & Mamun, M. (ICSOFT 2025). Thoth: A Lightweight Framework for End-to-End Consumer IoT Rapid Testing. Paper Link Here
- Ali, S. R. (2022).A Component-Based Analysis for Online Proctoring [Master's Thesis, the American University in Cairo]. AUC Knowledge Fountain. https://fount.aucegypt.edu/etds/1928.

Skills

Programming & Scripting: Python, Java, SQL, C++, Bash
Machine Learning & AI: LLM Fine-tuning, LLM Code Evaluation, Agentic AI, Prompt Engineering, PyTorch, TensorFlow, Scikit-learn, Hugging Face Transformers, Reinforcement Learning (PPO, ICM), Generative AI, LLM Fine-tuning
Automation & Software Engineering: Intelligent Automation (RPA, API-based workflows), Git/GitHub, CI/CD Pipelines, AWS, GCP, Test Automation (JaCoCo, JUnit), Software Testing (unit, integration, API, Security)

Experience

AI Consultant - R&D, BlinkTech Solutions Inc. – Windsor, ON — Sep 2024 – Mar 2025

- **Owned end-to-end project lifecycle** — from model design and development to deployment, client collaboration, and performance evaluation, demonstrating leadership and accountability
- **Automated verification of unresolved parcels** using LLMs, overcoming limitations of regex-based and Google Maps matching to handle ambiguous or incomplete addresses
- **Achieved 75%+ performance improvement** by cutting verification time from 10s to <1s per parcel, enabling real-time processing of 80,000+ daily parcels with higher efficiency and reliability
- **Developed and fine-tuned Foundational LLMs** using TensorFlow and PyTorch for specialized logistics use cases, contributing applied AI research to real-world business challenges

Research Assistant, University of Windsor – Windsor, ON — Sep 2023 – Present

- Created a **Deterministic LLM code response evaluation** framework that Leverages embedding models (LSTM, GNN) and Transformer architectures
- Introduced a new metric, Alignment Score, to classify generated code via data labels

- Designed and implemented a **LLM-based Multi-Agent Reinforcement Learning Tool (AdativeRestTest) for Automated API fault discovery** that leverages diversified reward functions for exploration
- **Optimized LLM Prompts** to direct the agent to discover faults achieving up to **29% more faults detected** than the baseline and **up to 128%** more diverse requests

- Designed and implemented Thoth: **A Lightweight End-to-End IoT Testing Framework**, introducing the **first comprehensive, metrics-driven approach** for evaluating **performance, reliability, recovery, security, and cascading failures** in consumer IoT systems

- Validated Thoth on real-world health-monitoring setups, achieving **fault detection in 2.5s**, **recovery under 1s**, **minimal data loss**, and **<1% energy overhead**, demonstrating its effectiveness for **scalable, low-intrusion IoT testing**

Research Project Mentor, University of Windsor – Windsor, ON May 2024 – Present

- Delivered hands-on workshops on Large Language Models (LLMs), prompt engineering, and Software Engineering practices to Master's students, bridging theory with practical implementation
- Designed and led interactive coding sessions covering prompt engineering, model fine-tuning, and software engineering workflows, enabling students to apply advanced AI techniques in real-world contexts
- Mentored graduate students on research projects, guiding them through experimental design, evaluation, and best practices in AI-driven software systems

Intelligent Automation Engineer, Robiquity – Cairo, Egypt Jun 2022 – Jul 2023

- Built **scalable automation pipelines** integrating RPA tools, Python scripts, and cloud services to streamline data flows across business systems
- **Led and mentored junior engineers**, ensuring effective collaboration, code quality, and timely project delivery
- Improved system reliability by reducing error rates and minimizing manual intervention through end-to-end process automation
- Delivered measurable business value by **accelerating financial workflows**, cutting manual effort by 10% in accounts receivable processing

Data Analyst, The American University in Cairo – Cairo, Egypt Jan 2022 – May 2022

- Collected, cleaned, and analyzed social media datasets using **Python (Pandas, NumPy) and SQL**, delivering insights that optimized posting schedules and media types
- Built dashboards and visual reports (Excel, Tableau/Power BI) to communicate findings, **increasing audience reach by 30%** and driving data-informed engagement strategies