YOUSSEF HUSSAIN

Data Scientist | AI Engineer

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Professional Summary

Computer Science graduate with a focus on AI Engineering and machine learning. Skilled in **Python**, **SQL**, and **Cloud solutions** with proven experience in end-to-end model development, deployment, and data analysis. Well-versed in software engineering fundamentals.

Work Experience

AI Engineer Intern

Cyber Talents — 3 Month Internship, 2025

- Built a **large language model (LLM) pipeline from scratch** to automate the generation of CTF writeups.
- Processed raw CTF writeups: cleaning, formatting, and structuring into usable datasets.
- Applied **data augmentation, model selection, fine-tuning, and PEFT techniques**.
- Deployed the trained LLM for automated writeup generation, improving efficiency in cybersecurity reporting.

Embedded Linux Engineer Intern

El Sewedy Electric — 2 Month Internship, 2025

- **Automated** the calibration process for electric meter test benches using Python scripts, significantly reducing manual testing time and improving data accuracy.
- Developed and executed Bash scripts for **system administration** and process management in an embedded Linux environment.
- Interfaced with hardware devices using communication protocols (UART, I2C, SPI) and built foundational **REST APIs** with Python for device interaction.

Network Security Intern

Optima Professional Services — 1-Month Internship, 2025

- Performed as a SOC Analyst in a CTF simulation, actively monitoring firewall logs to detect and report intrusion attempts in real-time.
- Configured and deployed firewall policies on **Palo Alto** networks to isolate threats and secure critical network zones.
- Executed Red Team operations by conducting scans, exploiting identified attack vectors.

EDUCATION

Bachelor of Computer Science – AI Specialization

Ahram Canadian University - Giza, Egypt
Graduation: June 2025

American Diploma – High School

Smart Vision international School - Giza, Egypt
Graduation: June 2021

Skills

- **Programming & Scripting:** Python (Pandas, NumPy, Scikit-learn), SQL, JavaScript, HTML, CSS, Bash, C++.
- **Machine Learning:** Supervised/Unsupervised Learning, Feature Engineering, Model Selection, Hyperparameter Tuning, Cross-validation, Ensemble Methods
- **Deep Learning & AI:** Neural Networks, CNNs, RNNs, Transformers, LLMs, Fine-tuning, Transfer Learning, PyTorch, TensorFlow, RAG (Retrieval-Augmented Generation), LangChain, Langgraph, Langflow, PydanticI, PEFT Teachniques.
- **Databases & Backend Development:** PostgreSQL, MySQL, MongoDB, Prisma (SQLite) Database Design, Data Warehousing Concepts, REST APIs, FastAPI, Express.js, Docker.
- **Data Analysis & Visualization:** Data Collection, Data Cleaning, Data Preprocessing, Exploratory Data Analysis (EDA), Statistical Analysis, Power BI, Excel, Pandas, NumPy, Matplotlib, Seaborn.
- **Tools & Technologies:** Git, Linux, Cloud Services (AWS), Virtualization, Automation (n8n).
- **Soft Skills:** Strong Communication, Teamwork, Problem-Solving, Analytical Thinking, Attention to Detail, Curiosity, Adaptability, Eagerness to Learn.

Academic & Personal Projects

AI-Powered Auction Backend
- Built a scalable Node.js backend for an online auction/e-commerce platform.
- Integrated an **LLM** (Large Language Model) as a RAG chatbot.
- Developed a specialized **NLP model** that performed semantic comparison between the AI-generated image captions generated by openai/CLIP and the user-provided item descriptions, flagging discrepancies or potential misrepresentations to ensure data integrity and transparency.
- Designed robust APIs for seamless user interaction, secure payment processing via Stripe, and item recommendation.
- **Key Impact**: Delivered a sophisticated, production-ready AI pipeline that significantly enhanced content validation, automated crucial quality control, and built greater trust in e-commerce listings

CTF Writeup LLM

- Developed an **end-to-end LLM pipeline** to automate CTF challenge writeups.
- Processed raw writeups: cleaning, structuring, and augmenting data for fine-tuning.
- Selected the most appropriate **model, parameter-efficient fine-tuning (PEFT), and deployment**.
- Built a scalable system that generated **structured, human-like reports**, reducing manual effort for cybersecurity professionals.
- Built 3 different versions: finetuned opensource, GPT-4 finetuned, Gemini, prompt engineering + RAG.
- **Impact:** Demonstrated expertise in **data preparation, LLM fine-tuning, and deployment** for real-world cybersecurity applications.

Hotel WhatsApp AI Agent

- Developed a **conversational AI agent** for a hotel, accessible via WhatsApp.
- Used Langflow to develop a rapid MVP as proof of concept
- Used **LangChain, Langgraph, and Pydantic** for tool, state orchestration.
- Used **Supabase** as the backend and database for the guests information, readymade APIs to give to the agent as tools
- Integrated backend tools to:
  o Answer FAQ from hotel's knowledge base using (**RAG**, **CAG**) architecture.
  o Query databases for room availability, Booking, guest creation, and cancelation.
  o Handle **secure booking** directly via WhatsApp using the **ReAct** architecture + tools, rather than the general llm with tools approach.
- **Impact:** Delivered a real-world AI concierge, reducing customer service workload and enabling 24/7 automated booking.

AI Fitness & Nutrition Planner

- Built with **LangChain**, **Pydantic**, and **Google Gemini** to generate custom workout and nutrition plans.
- Outputs structured JSON using pydantic for workout schedules and macro targets.
- Features a conversational agent for follow-up questions and user support.

Certifications & Licenses

- IBM Data Analyst Professional Certificate
- IBM Data Science Professional Certificate