Abdelrahman Ayoub

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EDUCATION

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING 2021 - 2026

Bachelor of Engineering – Artificial Intelligence Engineering Program.

- Awarded 4th Top-Ranked Student among other students.
- "Distinctive Cumulative GPA 3.595 out of scale 4 – Equivalent Grade Excellent.

PROFESSIONAL EXPERIENCE

FREELANCE FULL-STACK & AI DEVELOPER 2024 - Present

- Engineered and deployed over 25+ scalable web applications and corporate platforms (including Mohcareer, Mediazad, Aquavita, and Gridex) utilizing Next.js, TypeScript, FastAPI, and Supabase.
- Developed custom e-commerce solutions, comprehensive real-estate portals, and service-oriented applications featuring role-based access, secure payment gateways, and multilingual support.
- Integrated Generative AI capabilities and LLM APIs into business workflows, designing intelligent chatbots and automated data processing pipelines.
- Managed end-to-end development lifecycles, collaborating directly with diverse clients to gather requirements, optimize UI/UX, and deliver high-performance digital solutions across international markets.

PUBLICATIONS

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING 2025 - 2026

UNDERGRADUATE RESEARCHER

- Co-authored and published a peer-reviewed research paper titled "IoT-Integrated robotic system for automated plant disease detection and environmental monitoring" in Scientific Reports (Springer Nature).
- Developed a novel, solar-powered autonomous robotic system utilizing deep learning and IoT technologies for real-time plant disease detection.
- Integrated cloud-based monitoring systems to provide farmers with real-time alerts and insights, supporting timely and informed agricultural decision-making.

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING 2023 - 2024

UNDERGRADUATE RESEARCHER

- Conducted research on Arabic abstractive text summarization using the Multilingual T5 model.
- Designed and implemented experiments to evaluate the effectiveness of the T5 model in generating high-quality Arabic summaries.
- Collaborated with a multidisciplinary team to fine-tune the model for Arabic linguistic structures and optimize performance.
- Analyzed model outputs using various evaluation metrics to assess summary coherence, fluency, and informativeness.
- Presented findings at the 2024 6th International Conference on Computing and Informatics (ICCI), published by IEEE.

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING 2023 - 2024

UNDERGRADUATE RESEARCHER

- Conducted a comparative study on Arabic text summarization techniques, evaluating Word Frequency Analysis, K-Means Clustering, and the PageRank Algorithm.
- Designed and implemented experiments to assess the performance of these techniques using metrics such as recall, precision, F1 score, compression ratio, and population standard deviation.
- Analyzed the effectiveness of each method in achieving optimal summary quality and information retention.
- Contributed to the development of insights into improving Arabic text summarization for diverse applications.
- Presented research findings at the 2024 International Mobile, Intelligent, and Ubiquitous Computing Conference (MIUCC), published by IEEE.

CERTIFIED PROFESSIONAL DEVELOPMENT

ARTIFICIAL INTELLIGENCE, CLOUD COMPUTING, FREELANCING, AND DIGITAL MARKETING:

- Microsoft Azure AI Fundamentals – Microsoft

- Microsoft C# Code – Microsoft
- AI on Azure – Microsoft
- Azure Machine Learning – Microsoft
- Freelancing Basics – Mahara-Tech
- Getting Started as a Freelancer (Upwork) – Mahara-Tech
- Getting Started as a Freelancer (Khamsat) – Mahara-Tech
- Getting Started as a Freelancer (Mostaql) – Mahara-Tech
- Introduction to Artificial Intelligence – SkillUp
- Working with Computers and Devices – LinkedIn
- Learning Data Analytics – LinkedIn
- InnovEgypt Entrepreneurship Training Program – ITIDA & TIEC
- Foundations of Digital Marketing – Google & The Open University

ATTENDED CONFERENCES

- The 2024 International Mobile, Intelligent, and Ubiquitous Computing Conference (MIUCC), organized by IEEE, focused on advancements in mobile computing, AI, and ubiquitous computing, and was held between 13-14 Nov.2024.
- The 2024 6th International Conference on Computing and Informatics (ICCI), organized by IEEE, highlights research in computing, artificial intelligence, and informatics, and is held between 6-7 March 2024.

AWARDS AND DISTINCTIONS

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING 2021 - 2026

UNPRECEDENTED UNDERGRADUATE ACADEMIC EXCELLENCE RECORDS AND AWARDS

- 3rd Top-Ranked Student in 2 Consecutive Undergraduate Academic Years (1st, and 2nd).
- 4th Top-Ranked Student in Undergraduate Academic Year (3rd).
- Exemplary Performance and A+ in all Neural Networks, Computer Vision, NLP, Advanced Machine Learning, Optimization Techniques, and Big Data Analytics Courses.

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING **February 2025**

- Ranked in the 1st place in Benha Hackathon.

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING **March 2025**

- Awarded Best Team at New Mansoura University in the Finology Competition.

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING **March 2024**

- Achieved Top 4 nationally in the Huawei ICT Competition (Innovation Track).

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING **February 2024**

- Ranked 5th place in Benha Hackathon in two separate rounds.

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING **July 2023**

- Ranked in the 15th place out of 355 teams in the ICMTC AI Competition.

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING **August 2023**

- Participated in the ECPC (Egyptian Collegiate Programming Contest.

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING **June 2023**

- DEBI Robotics Challenge Finalist.

SKILLS

Technical Skills:

TypeScript, Python, SQL, C#, C++, PHP, JavaScript, HTML, CSS

Web & Database Frameworks: Next.js, React, FastAPI, Django, Tailwind CSS, PostgreSQL, Supabase, SQLAlchemy

AI & Machine Learning: TensorFlow, PyTorch, LangChain, OpenAI API, Hugging Face, NLP, Computer Vision

Cloud & Tools: Microsoft Azure, Git, GitHub, WordPress, Figma, JWT Authentication, RESTful APIs

PROJECTS

VITALSYNC - DIGITAL TWIN HEALTHCARE MONITORING SYSTEM (GRADUATION PROJECT) **2025 - 2026**

- Architected and developed a comprehensive Digital Twin-based healthcare ecosystem for elderly care, integrating IoT, Cloud computing, and AI.
- Engineered a custom wearable IoT device using ESP32, MAX30100, MPU6050, and Neo-6M GPS for real-time physiological and motion data acquisition.
- Developed a scalable full-stack web application utilizing Next.js, Tailwind CSS, Supabase, and FastAPI to deliver role-based real-time dashboards for doctors, families, and administrators.
- Implemented and optimized multiple AI models, achieving 91.8% accuracy in health-risk prediction and 95.1% accuracy in real-time fall detection.
- Integrated Explainable AI (SHAP) for transparent clinical decision-making, Data Ingestion Contracts ensuring 99.4% data integrity, and an LLM-based Memory Bot supervised by Symbolic Safety Guardrails.

ARABIC SPEECH RECOGNITION IN EGYPTIAN DIALECT **July 2024**

- Developed an Arabic speech recognition system tailored to the Egyptian dialect using deep learning and natural language processing techniques.
- Trained models on extensive audio datasets to accurately transcribe spoken Egyptian Arabic into text.
- Fine-tuned speech-to-text algorithms for improved recognition of colloquial expressions and dialect-specific nuances.

AGRIBOT **May 2024**

- Designed and developed AGRIBOT, a robot for detecting plant diseases and analyzing soil conditions using computer vision and embedded systems.
- Integrated neural network models to classify plant diseases and assess soil health in real-time for precision agriculture.
- Implemented a hardware-software system that combines image processing and sensor data to provide actionable insights for farmers.

ARABIC ABSTRACTIVE SUMMARIZATION **March 2024**

- Co-led the development of an Arabic Abstractive Summarization model using the MT5 architecture to generate concise and accurate text summaries.
- Utilized advanced NLP and deep learning techniques to improve summarization beyond traditional extractive approaches.
- Collaborated with the research team on experiments, achieving state-of-the-art performance on Arabic datasets.

E-CORRESPONDENCE SYSTEM **January 2024**

- Built a custom e-correspondence system to streamline communication for 12 university departments, reducing email handling by 40%.
- Implemented secure user authentication and role-based access controls.
- Integrated with existing systems for automated notifications and improved document tracking.

BRAIN TUMOUR DETECTION **May 2023**

- Developed a CNN-based program to detect brain tumors from MRI images with 90% accuracy.
- Applied image preprocessing techniques such as normalization and augmentation to enhance detection accuracy.
- Collaborated with fellow students to fine-tune and deploy the program for effective image-based tumor detection.

FULL-STACK CORPORATE & E-COMMERCE PLATFORMS

- Architected and launched multiple production-ready platforms including Yammigo, Hamatex, and Prestige Visas, focusing on responsive design, fast loading times, and SEO optimization.
- Implemented robust backend infrastructures using RESTful APIs and PostgreSQL to support dynamic content management and real-time business operations.

EDUROBOT - VOICE-ENABLED EDUCATIONAL ASSISTANT

- Developed a comprehensive full-stack educational robot system for classroom environments featuring voice commands and automated attendance tracking.
- Integrated computer vision modules and a cloud-connected dashboard using Python, OpenCV, and Django to enhance student engagement.

INTELLIGENT CHATBOT DEVELOPMENT

- Designed and deployed specialized chatbots across multiple domains including healthcare and e-commerce.
- Utilized advanced NLP, machine learning, and LLM APIs to create knowledge-based expert systems and recommendation engines.

LEADERSHIP AND TEAMWORK EXPERIENCE

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING 2022 - 2025
INITIATIVE STUDENT UNION - Head of Graphic Design Team

- Led the design team to create engaging materials for university events, ensuring brand consistency across digital and print.
- Led events and designed promotional materials to enhance student engagement and cultural awareness.

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING 2021 - 2025

INNOVATORS CLUB - Head of Programmers Committee

- Led the Programmers Committee to organize coding workshops, mentor students, and develop technical projects.

NEW MANSOURA UNIVERSITY COLLEGE OF COMPUTER SCIENCE AND ENGINEERING 2022 - 2025

INITIATIVE STUDENT - Secretary of Cultural & Media Committee

- Organized cultural and media-related activities to enhance student engagement and representation.
- Managed communication strategies and content creation for faculty-wide events.

NEW MANSOURA UNIVERSITY 2024 - 2025

NMU STUDENT UNION - Technology Director

- Managed technological aspects of the union, overseeing digital transformation and IT operations.
- Led the media team, ensuring effective communication and branding across various platforms.

COMPUTER SKILLS AND LANGUAGE PROFICIENCY

Excellent command of Microsoft Office tools (Word, PowerPoint, Excel) and very good for presentation slides.

- **Bilingual:**
  English: Advanced.
  Arabic: Native or Bilingual Proficiency.

REFERENCES

Prof. Dr. Khaled Fouad
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