MAHMOUD SAYED YOUSSEF KOTB

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SUMMARY

Innovative and results-oriented educator and software engineer seeking a Teaching Assistant position in the field of Artificial Intelligence. Open to opportunities at universities and academic institutions with active AI programs. Bringing a strong background in machine learning, data science, and full-stack development, with a proven record in teaching thousands of students core computer science subjects such as Machine Learning, Graph Mining, Algorithm, Data Structures, and Probability. Passionate about Artificial General Intelligence (AGI) and committed to academic research and continuous innovation. Planning to pursue an MSc in Artificial Intelligence starting September 2025 to contribute to the advancement of intelligent systems and AI-powered education.

EDUCATION

- **B.Sc in Computers and Information Majoring in Bioinformatics**   Jul 2023
  Faculty of Computers and Information, Assiut University
  - General Grade: GPA (3.53 Out Of 4).
  - Graduation Project: Computer Vision and Signal Processing Project: **Vitalism Solution** (Contactless Estimation of Vital Signs Using Real-Time Video)
    - Developed an AI-driven system utilizing video-based analysis to estimate vital signs.
    - Implemented advanced image and signal processing techniques, including (rPPG) and wavelet filtering, to extract physiological data from video.
    - Achieved an **Excellent (A+)** grade for innovation and technical implementation.

TEACHING EXPERIENCE

Instructor | Udemy
- Instructed over 10,000+ students through courses on Discrete Mathematics for Computer Science, Probability & Graph Mining, and Data Structures & Algorithms, all delivered in Arabic.
- Produced educational videos on YouTube, accumulating approximately 500,000+ views up to 2024.
- Developed high-quality content, delivered structured lessons, and received excellent student feedback.
- Demonstrated strong communication skills in explaining complex technical concepts effectively.

WORK EXPERIENCE

Systems Soldier | The National Company for Roads Building and Development   Feb.2024 – Mar.2025
- Served as a Systems Soldier in the Control and Command Department during military service.
- Working on back-end maintenance for high-scale applications, including Egyptian toll stations and smart parking systems, serving thousands of cars daily (covering over 50% of Egyptian vehicles across 70% of the roads).
- Co-developed a desktop application to manage and store data across multiple departments and stores.
- Performing troubleshooting, debugging, and system optimizations to ensure the seamless operation of critical applications while leveraging technologies such as C#, .NET, Entity Framework, SQL Server, and Crystal Reports for software development and maintenance.

RESEARCH & PROJECTS

- **Gene Expression Analysis using Deep Learning**
  Developed deep learning models, including convolutional neural networks and autoencoders, to classify cancer types based on RNA-Seq gene expression data.
- **COVID-19 Genome Mutation Tracker**
  Created an interactive dashboard to track SARS-CoV-2 genome mutations using Python and Dash. Incorporated sequence alignment tools like BLAST and Clustal Omega for mutation analysis. Developed AI models to predict the functional impact of mutations on viral proteins.

- **Epigenetic Biomarker Discovery using Machine Learning**
  Analyzed DNA methylation data using feature selection methods to identify epigenetic biomarkers for early cancer detection. Employed machine learning classifiers such as Random Forest and Support Vector Machines for accurate classification.
- **AudioShield – Deepfake Audio Detection**
  Tools: Python, TensorFlow, Librosa, Streamlit, CNN
  Developed an AI-powered system to detect deepfake audio using mel-spectrograms and a CNN model. Integrated real-time prediction and user feedback via Streamlit with automated PDF report generation. Targeted applications include fraud detection, digital forensics, and media authentication.
- **Sales Forecasting Dashboard**
  Tools: Python, Pandas, XGBoost, Power BI
  Created a forecasting model to predict monthly product sales using historical sales data. Applied feature engineering and XGBoost regression. Visualized trends and model results in Power BI for business decision-making.
- **Warehouse & Inventory Management System**
  Tools: ASP.Net Core, Entity Framework, Microsoft SQL Server, C#
  Developed a full-stack inventory management system to streamline warehouse stock tracking. Integrated CRUD operations, barcode scanning, and automated stock level alerts for efficiency.
- **E-Commerce Web Application**
  Tools: Angular, Bootstrap, Stripe API, JWT Authentication
  Built an interactive e-commerce platform with product listing, cart functionality, and secure user authentication. Integrated Stripe API for seamless transactions and Angular Routing for enhanced navigation.
- **Mini-FAT File System & Shell**
  Tools: C++, Operating Systems, File System Design
  Engineered a simplified FAT-based file system with a custom shell supporting commands like cd, copy, del, and import/export. Designed for efficiency and robustness in file management operations.
- **ATM Transaction Data Analysis & Availability Assessment**
  Tools: R, dplyr, tidyr, ggplot2, SQL
  Analyzed ATM status data to assess availability, downtime impact, and manufacturer reliability. Identified trends in ATM activity, determined the percentage of inactive ATMs, and evaluated performance differences between NCR and Diebold Nixdorf machines.
- **Student Affairs System (Desktop Application)**
  Tools: C#, Windows Forms, Microsoft SQL Server
  Developed a desktop-based student management system to track academic records, analyze performance, and automate report generation, enhancing administrative efficiency.
- **Weather App – Real-Time API Integration**
  Tools: HTML, CSS, JavaScript, API, Bootstrap
  Developed a front-end weather application that fetches and displays real-time weather data from an external API. Implemented dynamic UI updates and responsive design for enhanced user experience.

TECHNICAL SKILLS

- Python, C++, C#, R, Go, JavaScript
- ML/DL Frameworks: (TensorFlow, PyTorch, Scikit-learn, OpenCV, NLTK)
- Data Exploration & Visualization (Matplotilb, Seaborn)
- Data cleanup and Transformation (OpenRefine)
- Data Analysis: (Pandas, NumPy, Matplotlib, Feature Engineering)
- Version Control Tools: Git, GitHub
- Data Structures & Algorithms
- OOP (C, C++, C#, Python)
- Design Patterns
- OS (Windows, Linux)
- Database (SQL, MongoDB)
- OpenGL using C++
- Back-end: WinForms, ADO.NET, ASP.NET Core, Entity Framework Core, SignalR, SQL Server
- Front-end: Angular, JavaScript, TypeScript ASP.NET MVC, AJAX
- UI & Styling: HTML5, CSS, Bootstrap
- Software Documentation
- Agile
- Self-Learing
- Leadership
- Critical Thinking
- Soft-Skills

TRAINING AND COURSES

- **Ai in Cybersecurity Course (420 hrs.) | NTI** [Link]
  It's a 420-hour program by the National Telecommunication Institute (NTI), including 288 hours of technical training in AI-driven threat detection, adversarial machine learning, and intrusion detection systems, plus 132 hours of career development. I completed it from Feb 2025 to Jun 2025.
- **Machine Learning Track (200 hrs.) | ITIDA – EME** [Link]
  It's a 3-month internship program under Egypt Makes Electronics, organized by ITIDA and managed by Ideaspace. I completed it from July 2023 to September 2023.
- **Data Analysis Training using R | Children's Cancer Hospital Foundation 57357** [Link]
  This program focuses on practical skills in data analysis, statistical modeling, and visualization using R. It is designed for individuals interested in healthcare analytics and research.
- **Full Stack Development Diploma (.Net & Angular) | Route Company** [Link]
  I obtained diploma from May 2023 to February 2024.
- **.NET Web Development Course (120 hrs.) | iTi.** [Link]
  Covered ASP.NET MVC, Web API, Razor Pages, Blazor, SignalR, and Identity.
- **Introduction to SQL Server & C# Course (90 hrs.) | iTi.** [Link]
  Covered database design, queries, stored procedures, triggers, functions, LINQ, and Entity Framework.
- **Introduction to Mearn Stack Development Course (60 hrs.) | iTi.** [Link]
  Covered MongoDB, Express.js, React.js, and Node.js.
- **Intro to UI/UX Course (60 hrs.) | iTi.** [Link]
  Covered UX Fundamentals, Design process, Prototyping.
- **Android Mobile Development Course (30 hrs.) | iTi.** [Link]
  Covered Android Studio, Java, XML, and Introduction to mobile development.

Mathematics for Machine Learning – Coursera
Machine Learning Specialization – Coursera
DEV276x: Learn to Program in Java by Microsoft
What is Data Science? By IBM

COMPETITIONS AND AWARDS

- **First Place in Smart Cities Hackathon | March 24-26, 2022**
  Developed a smart solution for monitoring vital signs of intensive care patients in hospitals.
  Achieved first place across governmental, private, and national universities in Egypt. [Link]
- **First Place in Ideal Student Competition | College of Computers and Information, 2022-2023**
  Awarded first place among students of the College of Computers and Information. [Link]
- **Finalist, ISEIC-2023 (The International Scientific and Engineering Innovation Competition)**
  Qualified Vitalism Project (Contactless Estimation of Vital Signs Using Real-Time Video) to the final round.
  Competed against over 800 teams at the competition held at the Air Defense College. [Link]
- **First Place with White Hackers Team | College of Computers and Information, Assiut University**
  Science and Technology Content Industry Competition at the college level (2021-2022). [Link]
- **Semi-Finalist, Microsoft Imagine Cup 2023**
  Vitalism Project qualified for the semi-finals of the global Microsoft Imagine Cup competition.

LEADERSHIP AND EXTRACURRICULAR ACTIVITIES

- **Secretary of the Higher Scientific and Technological Committee of the Student Union at Assiut University for the academic year 2021-2022.** [Link]
  - Encouraged students to participate in scientific and technological activities.
  - Supported scientific competitions, inventions, and innovations.
  - Acted as a link between students and university administration.
  - Honored by external institutions for outstanding efforts in making student activities successful.
- **Ambassador for the Institute of Information Technology (ITI) in Assiut.** [Link]

- **Volunteer Team Leader | University Center for Career Development by USAID** [Link]
  - Bridged the gap between university education and labor market requirements.
- **Board Member | Smile Makers Association for Orphan Sponsorship and Community Development in Assiut Governorate, which is known as No. 940 of 2011 (Affiliated with the Ministry of Social Solidarity)** [Link]
  - Volunteered in the summer educational club to develop children's scientific skills.
  - Taught mathematics, science, and programming to children.

SOFT SKILLS COURSES

- Employability Skills by Aspire in cooperation with UCCD Assiut University. [Link]
- Project Management Course by American Chamber of Commerce in Egypt. [Link]
- Green & Smart Technologies Assiut Boot Camp by British University in Egypt. [Link]
- Assiut University Leaders Preparation Camp for 2021-2022. [Link]

LANGUAGES

- **Arabic**: Native Language
- **English**: Very Good
- **French**: Little knowledge

HOBBIES

- Fish Hunting
- Photography
- Cooking