# Khaled Ashraf Mowad
# AI Engineer | Digital Twin Engineer

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## Summary

Digital Twin and AI Engineer with expertise in **Computer Vision (CV), Natural Language Processing (NLP),** and **Machine Learning (ML).** Skilled in **developing and optimizing AI models for real-world applications**, including **Object Detection, Image Segmentation, Text Analysis, and Digital Twin simulations**. Experienced in Retrieval-Augmented Generation **(RAG), AI Agents, and LLM fine-tuning using Hugging Face and PyTorch**. Proficient in Python, **TensorFlow**, and deployment tools such as **FastAPI and Docker, with a strong focus on 3D modeling, IoT integration, and data analytics.**

## Education

**Faculty of Engineering, Kafr El-Sheikh University, Egypt** **2019 - 2024**

- Major: Computing and Control Systems

## Experience

**Digital-Twin Engineering Intern - National Telecommunication Institute (NTI)** **Feb 2025 – 2025 June**

- Develop AI-driven 3D modeling, simulation, and data analytics solutions using Digital Twin technology.
  Integrate AI, Computer Vision, IoT, and NLP to enhance real-time system performance.
  Utilize Python, TensorFlow, PyTorch, and deployment tools for model development and optimization.

**Machine Learning Engineer Intern** **Apr 2024 – Sep 2024**

- **DEPI - Microsoft ML Track, Ministry of Communications and Information Technology, Egypt**
  Completed 200 hours of Machine Learning and Deep Learning training.

**Python and Robotics Instructor (Freelance and On-Site)** **Jan 2022 – Jun 2024**

- Designed and delivered Python programming and robotics curricula for children.

  Enhanced students' problem-solving skills through hands-on coding projects.

## Projects

### CyberFortNox – Graduation Project

- Developed a platform to detect, classify, and decrypt malware using Convolutional Neural Networks (CNNs).
  Integrated encryption/decryption techniques to analyze malicious files.
  Combined data analysis, cybersecurity, and deep learning to detect sophisticated threats.

### AI Football – Computer Vision Project

- Built an end-to-end system to analyze football players movements using YOLOv8 for real-time player detection.
  Generated heatmaps and Voronoi diagrams to visualize player activity and team dominance.
  Implemented field layout detection to align with player positions.

## Skills

- **Programming Languages:** Python
- **Data Analysis & Visualization:** Pandas, NumPy, Matplotlib, Seaborn
- **Machine Learning:**
  Supervised Learning, Unsupervised Learning, Regression, Classification, Clustering, Model Evaluation, Cross-Validation, Model Tuning
- **Deep Learning:**
  TensorFlow, Keras, PyTorch, CNNs, RNNs, LSTMs, Transformers, Transfer Learning, YOLO, Faster R-CNN, Hugging Face
- **Computer Vision:**
  Object Detection, Image Segmentation, YOLOv8
- **Natural Language Processing:**
  Text Preprocessing, Tokenization, Named Entity Recognition (NER), Sentiment Analysis, BERT, GPT, Transformers, **RAG**, Hugging Face
- **Model Deployment:** FastAPI, Flask, Docker, TensorFlow Serving, TorchServe, MLflow
- **Digital Twin Technology:**
  AI Integration, 3D Modeling, IoT, MQTT, Data Analytics, Blender, Unity, NVIDIA Omniverse

- **Additional AI Expertise**: LLM Proxies, LLM Applications, LLM Fine-Tuning, AI Agents, MCP (Model Context Protocol)
- **Soft Skills:** Problem-Solving, Analytical Thinking, Debugging, Optimization

## Certifications

- **Microsoft Machine Learning Engineer – AI & Data Science Track ( DEPI)**
  Ministry of Communications and Information Technology, Egypt (200 hours, 2024)
- **Deep Learning for Computer Vision** – Udemy
- **Convolutional Neural Networks with TensorFlow in Python** – 365 Data Science
- **Transformers in Computer Vision** – Udemy
- **Deployment of Machine Learning Models** – Udemy
- **AI Agents using CrewAI Course** – Online
- **Rag -** Online