Hani Elshafei

Artificial Intelligence Instructor | Data Scientist | Geo AI Researcher |

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Marital Status: Married.
Location: Riyadh.
Portfolio: My Github link

Profile

- Experienced Artificial Intelligence Instructor and Data Scientist with over 7 years of expertise in AI, Machine Learning, and Deep Learning. Specialized in Computer Vision, Natural Language Processing (NLP), and Geo AI research. Skilled in leading end-to-end data projects including data collection, cleaning, feature engineering, analysis, modeling, and deployment. Proficient in Python, TensorFlow, PyTorch, and scikit-learn. Dedicated to staying updated with the latest advancements in AI and contributing to research and innovation in the field.

Achievements:

- **Developed and Implemented Advanced AI Curriculum**: Designed and delivered an innovative AI curriculum that received high praise from students and peers. Incorporated real-world case studies and hands-on projects to enhance learning outcomes and practical skills for **UCCD Mansoura Engineering**.
- **Lead AI Research Project**: Successfully led a team in a research project focusing on novel deep learning architectures for image recognition, (**Geonosis Team Mansoura University > AI For Transportation)**.
- **Mentored Successful AI Projects**: Mentored students or junior developers in executing AI projects, guiding them to achieve outstanding results or recognition in competitions.
- **Implemented AI Solutions for Real-World Problems**: Designed and deployed AI solutions that addressed real-world challenges, resulting in tangible improvements in efficiency, accuracy, or cost-effectiveness for organizations or communities.
- **Implemented LLM and Generative AI Solutions:** Developed a generative chatbot using GPT-4, capable of handling complex conversations in both English and Arabic for customer support and education applications.
- **LLM-Based NLP Projects:** Implemented advanced LLM models for sentiment analysis, named entity recognition, and summarization for enterprise-level projects.
- **AI Master** Artificial intelligence and spatial data science and their role in urban transportation solving problems in Mansoura (Master Research)
- **Computer Vision** Algorithms for Remote Sensing Image Classification Project for (Mansoura University)
- **Object-based crop classification** with Machine Learning Classification Project for (Mansoura University)
- **Image Classification** in Google Earth Engine Classification Project for (Mansoura University)

Courses Delivered (As Instructor)

- **AI for Healthcare**
  Focused on applying AI to healthcare challenges, including predictive modeling, diagnosis support, and medical imaging.

- **LLMs and Generative AI**
  Delivered an in-depth course covering foundational concepts, prompt engineering, fine-tuning, and applications of large language models.
- **T5 Bootcamp**
  Hands-on bootcamp focused on Google's Text-to-Text Transfer Transformer (T5) for advanced natural language processing.
- **ALLaM LLMs Bootcamp**
  Specialized training on Arabic Large Language Models and Retrieval-Augmented Generation (RAG) pipelines.
- **AI Backend Applications**
  Practical course on building and deploying AI-powered backend systems using FastAPI, OpenAI API, and vector databases.
- **Neural Networks and Deep Learning**
  Comprehensive course covering fundamentals of deep learning, CNNs, RNNs, and model training techniques.
- **Computer Vision for Satellite Imagery**
  Taught techniques for processing satellite data, segmentation, classification, and computer vision applications in remote sensing.
- **Project Management for Data Leaders**
  Designed for technical leaders in data and AI, covering agile methodologies, team management, and project delivery.
- **Autonomous Driving: Deep Learning & Computer Vision**
  Covered object detection, lane tracking, and perception models used in self-driving vehicle systems.
- **Data Scraping & Mining with Python**
  Practical course on automated data collection, web crawling, and intelligent information extraction.
- **Geospatial AI with Python (GeoPandas & Remote Sensing)**
  Delivered hands-on training in geospatial analysis and smart city applications using Python libraries and spatial datasets.
- **Google Earth Engine for Smart City Intelligence**
  Guided participants in using GEE for urban monitoring, environmental prediction, and spatial AI modeling.
- **Interactive Dashboards for AI Projects**
  Taught real-time dashboard development using Plotly and Dash to visualize ML models and data pipelines

Data Science Expertise

With extensive expertise in artificial intelligence and data science, I specialize in integrating geospatial, medical, and economic data to support decision-making. My skill set includes leveraging AI and machine learning for spatial data analysis, remote sensing, and geospatial intelligence, while also applying advanced analytics to medical and economic datasets. This

multidisciplinary approach enables me to develop comprehensive models and solutions that address complex challenges across various domains, driving informed and impactful decisions.

Healthcare Data Science Skills

- **Medical Imaging Analysis:** Proficient in analyzing medical imaging data, including X-rays, MRIs, and CT scans, using deep learning techniques (CNNs, segmentation models) for tasks like disease detection, segmentation, and classification.
- **Electronic Health Records (EHR) Analytics:** Expertise in processing and analyzing EHR data for predictive modeling, patient clustering, and identifying trends in healthcare delivery and outcomes.
- **Healthcare Machine Learning:** Skilled in applying machine learning techniques (e.g., classification, regression, clustering) for healthcare applications using frameworks such as TensorFlow, PyTorch, and Scikit-learn.
- **Time-Series Analysis for Health Data:** Experienced in analyzing and forecasting health-related time-series data, such as patient vitals, ICU monitoring, and epidemic trend prediction.
- **Health Data Integration & Engineering:** Expertise in integrating and preprocessing diverse healthcare datasets, including genomic data, wearable device data, and clinical trial data, for actionable insights.
- **Healthcare AI Applications:** Developed AI-driven solutions for personalized medicine, drug discovery, and hospital resource optimization using advanced data science techniques.

Smart Cities & Urban Intelligence

- **Spatial AI for Urban Planning:** Developed AI-driven geospatial models for smart city applications including traffic flow optimization, land use planning, and infrastructure monitoring.
- **Smart Mobility & Transportation:** Applied AI and computer vision for intelligent traffic systems, public transport optimization, and autonomous vehicle perception systems in urban settings.
- **Urban Environmental Monitoring:** Leveraged remote sensing and satellite imagery to assess air quality, detect urban heat islands, and support sustainable development initiatives.
- **Geo-AI for Infrastructure Management:** Built predictive models using spatial and sensor data for asset monitoring, maintenance planning, and emergency response.
- **Smart City Dashboards & Insights:** Designed interactive dashboards to visualize urban AI insights, enabling real-time decision-making for municipalities and city planners.
- **Integration with IoT and Smart Sensors:** Combined IoT data streams with AI models for real-time urban analytics and automation of city services.

AI in Sports Analytics

- **Performance Analysis & Tracking:** Used deep learning models to analyze athlete movements, detect poses, and provide performance feedback using video analytics and wearable sensor data.
- **Injury Prediction & Prevention:** Built ML models using physiological and historical performance data to predict and prevent sports injuries.
- **Tactical Strategy Optimization:** Applied machine learning for analyzing team formations, predicting opponent behavior, and optimizing game strategies.

- **Fan Engagement with AI:** Developed chatbots and recommendation systems to enhance fan interaction, personalize experiences, and deliver match insights in real-time.
- **Sports Broadcast Automation:** Automated highlight detection and sports summarization using computer vision and NLP.
- **AI for Talent Scouting:** Analyzed player statistics and performance metrics with AI tools to identify emerging talents and optimize recruitment decisions.

Geospatial Data Science Skills

- **Satellite Imagery Analysis:** Proficient in analyzing satellite and aerial imagery for tasks like land use classification, road detection, and object recognition using deep learning techniques (CNNs, segmentation models).
- **Remote Sensing:** Expertise in remote sensing image classification, including vegetation index analysis, crop monitoring, and land cover classification.
- **GIS Tools & Technologies:** Advanced user of GIS tools such as ArcGIS, QGIS, Google Earth Engine, and Python-based libraries like GeoPandas, Rasterio, and Shapely.
- **Geospatial Machine Learning:** Skilled in applying machine learning techniques (e.g., clustering, classification, regression) for spatial data using frameworks such as TensorFlow and PyTorch.
- **Spatial Data Engineering:** Experience in handling large-scale spatial datasets, including data preprocessing, spatial feature engineering, and integration with external data sources (DEM, land use, meteorological data).
- **Spatial Databases & APIs:** Knowledge of working with spatial databases (PostGIS) and geospatial APIs for retrieving, processing, and visualizing geospatial data.
- **Time-Series Analysis for Geospatial Data:** Expertise in time-series forecasting of spatial data, particularly for environmental and climate studies.
- **Computer Vision for Satellite Images:** Applied deep learning models for analyzing space and satellite imagery for tasks like object detection, road segmentation, and change detection.
- **Geospatial Data Science Applications:** Developed applications for urban planning, transportation optimization, and natural resource management using AI-driven geospatial models.

Language Skills:

- **Arabic:** Mother language.
- **English:** Very Good command of speaking, writing, and listening.

Relevant Skills & Area of Expertise:

- **AI & Machine Learning**: Proficient in various machine learning algorithms such as supervised learning (classification, regression), unsupervised learning (clustering, dimensionality reduction), and reinforcement learning. Skilled in implementing algorithms using libraries such as TensorFlow, PyTorch, and scikit-learn.
- **Natural Language Processing (NLP)**: Experienced in NLP techniques including sentiment analysis, named entity recognition, topic modeling, and text summarization. Capable of building NLP models using tools like NLTK, spaCy, and Gensim.
- **Natural Language Processing (NLP) & LLMs:** Specialized in developing and fine-tuning large language models (LLMs) like GPT and BERT. Proficient in NLP techniques such as text

summarization, sentiment analysis, named entity recognition, and text generation. Skilled in prompt engineering for optimal LLM performance.
- **Generative AI:** Experienced in applying generative adversarial networks (GANs) and diffusion models for text and image generation, as well as synthetic data generation.
- **Prompt Engineering:** Expertise in advanced prompt engineering techniques such as Chain of Thought (CoT), ReAct, and in-context learning for improving LLM outputs.
- **Model Deployment & MLOps:** Hands-on experience deploying LLMs and generative AI models using cloud-based platforms (AWS, Hugging Face) and tools like LangChain, FastAPI, and Docker.
- **Computer Vision**: Expertise in computer vision tasks like object detection, image classification, image segmentation, and facial recognition. Proficient in frameworks such as OpenCV, TensorFlow Object Detection API, and PyTorch.
- **Deep Learning**: Strong understanding of deep neural networks architectures including convolutional neural networks (CNNs), recurrent neural networks (RNNs), and generative adversarial networks (GANs). Skilled in designing and training deep learning models for various applications.
- **Data Preprocessing & Feature Engineering**: Proficient in data cleaning, preprocessing, and feature engineering techniques to prepare data for machine learning models. Experienced in handling structured and unstructured data from various sources.
- **Model Evaluation & Optimization**: Expertise in evaluating machine learning models using appropriate metrics and techniques. Skilled in hyperparameter tuning, cross-validation, and ensemble methods to optimize model performance.
- **AI Ethics & Responsible AI**: Knowledgeable about ethical considerations and biases in AI systems. Familiar with techniques for ensuring fairness, transparency, and accountability in AI applications.
- **Programming Languages & Tools**: Proficient in Python programming language for AI development. Experienced in utilizing libraries and frameworks such as NumPy, Pandas, Matplotlib, and Jupyter Notebook for data analysis and visualization.
- **Teaching & Communication**: Effective communicator with the ability to explain complex AI concepts in a clear and understandable manner. Experienced in designing and delivering AI courses, workshops, and training sessions for diverse audiences.
- **Research & Innovation**: Passionate about staying updated with the latest advancements in AI and contributing to research and innovation in the field. Experienced in conducting experiments, publishing papers, and participating in AI-related projects and initiatives.
- **Project Management**: Capable of leading AI projects from conception to deployment, including requirement analysis, planning, execution, and monitoring. Skilled in collaborating with interdisciplinary teams and stakeholders to achieve project goals.
- **Continuous Learning & Adaptability**: Committed to continuous learning and self-improvement in the rapidly evolving field of AI. Adaptive to new technologies, methodologies, and best practices to stay ahead in the field.
- **Time Series Analysis**: Proficient in analyzing time series data for forecasting and anomaly detection.
- **Graph Analytics**: Experienced in analyzing complex relationships within graph data.
- **Recommender Systems**: Capable of building personalized recommendation systems.
- **Interpretability and Explainability**: Familiar with techniques for making AI models interpretable.
- **Federated Learning**: Understanding of collaborative learning across decentralized devices.

- **Big Data Technologies**: Knowledgeable about processing large-scale datasets efficiently.
- **Computer Vision for Space and Satellite Images**: Expertise in analyzing space and satellite imagery for tasks such as object detection, image classification, and image segmentation.

LLM & Generative AI Projects

- **Generative Chatbot with GPT-4:** Built a chatbot for educational institutions capable of real-time question answering and conversation in English and Arabic using OpenAI's GPT-4.
- **Text Summarization System:** Developed a text summarization system for news articles using pre-trained LLMs.
- **Synthetic Data Generation with GANs:** Designed a GAN-based model for generating synthetic data to augment training datasets for NLP tasks.

Work Experience:

Position	**Artificial Intelligence and Data Science Instructor @ Kaplan Middle East & North Africa**
Project	**: KAPLAN Bootcamps**
Project Details	**:** Explaining all AI theoretical and practical aspects about LLM , Computer vision. **: as(Linear Algebra – Statistics – SQL - None Relational Databases(MangoDB) – Python – Data Science-Machine Learning -Deep Learning -Advanced Deep Learning(Computer Vision-NLP)-Generative AI – MLOPS)**
Period	**:** till present
Location	**: Dubai, United Arab Emirates**
Position	**: Artificial Intelligence and Data Science Instructor @ Tuwaiq Academy**
Project	**: SDAIA (T5) Bootcamp .**
Project Details	**:** Explaining all AI theoretical and practical aspects about LLM , Computer vision. **: as(Linear Algebra – Statistics – SQL - None Relational Databases(MangoDB) – Python – Data Science-Machine Learning -Deep Learning -Advanced Deep Learning(Computer Vision-NLP)-Generative AI – MLOPS)**
Period	**:2024**
Location	**: Riyadh –** KSA
Position	**: Artificial Intelligence and Data Science Instructor**
Project	**: Simplilearn Bootcamps .**
Project Details	**:** Explaining all AI theoretical and practical aspects for graduates and employees. **: as(Linear Algebra – Statistics – SQL - None Relational Databases(MangoDB) – Python – Data Science-Machine Learning -Deep Learning -Advanced Deep Learning(Computer Vision-NLP)-Generative AI – MLOPS)**
Period	**:Nov.**2021- till 2023
Location	**: Riyadh –** KSA

Position **Project** **Project Details** **Period** **Location**	**: xMap, Japan.** **: Geospatial Data Scientist and Geo AI researcher.** : Feb-2020 till now. : Include, but are not limited to: :
Position **Project** **Project Details** **Period** **Location**	**: Machine Learning and Data Science Instructor** **: UCCD Mansoura Engineering.** : The UCCD project is a nexus of cooperation between AUC and 12 public universities to establish 20 centers for career development. : **Nov.**2015- 2019 : Egypt.
Company **Position** **Project Details** **Period**	**: Fah Elhomrany, Jeddah, Ksa.** **: GIS Analyst** : Regular GIS Analysis : 2010-2015

Academic Education and Professional Courses:

- Geoscience and maps visualization, Geographic Information System Department, Mansoura University, Egypt, 2007.
- Artificial Intelligence and Geospatial data science master researcher, GIS Program, an accredited program that combines three sections (GIS, Computer Science, Automated Control) - Mansoura University
- Computer Science Faculty of Graduate Studies for Statistical Research Cairo university **[Ongoing]**
- The University of California, Davis (Fundamentals of GIS - GIS Data Formats, Design and Quality - Geospatial and Environmental Analysis - Imagery, Automation, and Applications - Geospatial Analysis Project) **[Online]**
- Yonsei University Spatial Data Science and Applications. **[online]**
- Duke University Data Science Math Skills. **[online]**
- Stanford University Machine Learning. **[online]**
- Udacity Data Analysis Professional Nanodegree Program, Data Analysis Professional Nanodegree.

Projects I Supervised:

- Earth observation detection >> Computer Vision and Remote Sensing From satellites
- Fast Diagnosis System >> Computer Vision for heathcare
- Murshed Chatbot >>NLP
- TASHEEL Educational Chatbot >>NLP
- 3عرابerab >>NLP
- Chatmap

References

Available upon request.