Ahmed Osama Alkadi

Mechanical and AI Engineer

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PROFILE

Mechanical Engineer with a solid foundation in engineering principles, graduated from Alexandria University, Egypt. I have practical experience with professional mechanical software tools and a strong understanding of machine learning, enhanced by a 9-month AI and ML scholarship at ITI. Proficient in Python and deep learning algorithms, I am enthusiastic about integrating AI solutions into traditional engineering processes for innovative and optimized outcomes.

EDUCATION

9-Month Professional AI and ML Scholarship
Information Technology Institute (ITI) ✎
10/2023 – 07/2024
Alexandria, Egypt

It is a fully funded Scholarship by the ministry of information and communication technologies in Egypt.
The AI and Machine Learning track provides a comprehensive understanding of AI and its applications. It covers concepts like supervised/unsupervised learning, neural networks, deep learning, and natural language processing. Practical aspects include data preprocessing, model evaluation, and optimization. Participants gain hands-on experience and a solid foundation in AI principles. Prerequisites: basic programming, statistics, and linear algebra. ✎

Bachelors of Science in Mechanical Engineering.
Faculty of Engineering, Alexandria University
06/2015 – 07/2020
Alexandria, Egypt

Cumulative Grade (85.88%) – (Excellence with Honor), 8TH over 420 students, class 2020.
The mechanical engineering department focuses on the design, analysis, optimization, and manufacturing of mechanical systems. Key areas include thermodynamics, fluid mechanics, dynamics, materials science, and mechanical design. The department engages in research in power stations design and optimization, renewable and desalination systems, aerospace, and biomechanics.

WORK EXPERIENCE

Teacher Assistant
Physics and Mathematics department, Faculty of Engineering Alexandria University.
11/2023 – present
Alexandria, Egypt

Electric Vehicles Researcher Engineer
Mechanical Engineering Department, Alexandria University ✎
07/2022 – 05/2023
Alexandria, Egypt

Electric Vehicles Researcher, leading a team of mechanical engineers. My role is to manage the design process, investigate, and construct a cooling system of the battery system of an electric vehicle. The project is a cooperative work with the military technical college. The project is adopted by The Arab Organization of Industrialization to make the first locally made EV.

Co-author of published paper in the field of thermal storage units
Journal of Energy Storage Volume 62, 106832 ✎
04/2023
Alexandria, Egypt

The research paper titled "The influence of elliptic aspect ratio and inclination angle on the melting characteristic of phase change material in concentric cylindrical enclosure".
The published paper discuses experimentally and analytically the effect of the orientation and the geometry of the storage unit on the melting time, which concludes a commercially-optimized design for domestic use storage solar heaters.

The Journal of Energy Storage focusses on all aspects of energy storage in particular systems inegration, electric grid integration, modelling and analysis with impact factor of (8.9), Cite Score of (11.8) ✎

Mechanical Designs Engineer
Metito Water Treatment Company
Worked on three international projects, collaborating with multidisciplinary teams in
Tunisia and Algeria, as well as on various projects in Egypt. My role was to set the plant
General Arrangement, design the piping system and treatment processes and integrate with
other departmnets.

07/2022 – 10/2023
Cairo, Egypt

SKILLS

CFD and FE analysis
Ansys fluent/ Structure

Programming Languages
Python, C, C++, MATLAB and EES
SQL and NoSQl

Data Processing and Visualization
Pandas, Matplotlib, Seaborn
Plotly, Dash, PowerBI

AWS Cloud
AWS Academy Cloud Foundations Certified ⊘

Modeling and CAD design
Solidworks drawing, modeling and simulation
AutoCAD 2D & 3D drawing

Machine and Deep Learning
Scikit-learn, numpy, PyTorch, TensorFlow and OpenCV
Recommender systems, Computer vision and NLP.

Deep Learning

Deep learning Specialization by Coursera ⊘

TensorFlow Specialization by Coursera ⊘

EXTRACURRICULAR ACTIVITIES AND ACHIEVEMENT

Head of Mechanical Engineers | LYCANS Team |SAE Aero Design competition, USA ⊘
*Field Team Captain 2022 , Head Technical Mechanical Engineer responsible for wing design, aerodynamics analysis, and
manufacturing in LYCANS team.*

LYCANS Facebook Page ⊘
LYCANS team participated in SAE aero design West 2022, California, USA. LYCANS ranked 4th overall among more than
47 teams around the world.
LYCANS team participated in SAE aero design East 2021, Florida, USA. LYCANS ranked 2nd in the mission performance.
LYCANS team participated in SAE aero design West 2020, Texas, USA. LYCANS ranked 6th overall.

AI PROJECTS (SELECTED)

Computer Vision. Visual And Textual Product Similarity Recommendation ⊘
This project recommends products based on their textual and visual similarity using cosine similarity. Visual features are
extracted with ResNet-50, textual features with TinyBERT-6L, and images are preprocessed by removing backgrounds
using a UNet model with MobileNetV2 encoder. Features are combined into vectors, stored in a vector database, and used
to find and visualize the top similar products.
Tools: Pytorch, TensorFlow, OpenCV Libraries and Pinecone vector Database

NLP. Arabic Dialect Classifier ⊘
The project aims to build a model to identify and classify different Arabic dialects from text data, ranges from using
traditional ML Algorithms like LR and decision trees to more complex DL approaches such as LSTMs and hybrid models
combining CNNs with LSTMs, to improve accuracy in dialect classification.

Computer Vision. Driver distraction detector ⊘
The project aims to identify the types of distracted driver through their facial and body movement like arms and face
pose. The project went through many stages of testing to increase the accuracy of the prediction from using simple NN to
use pretrained models.
Tools: TensorFlow, Scikit-learn and MatplotLib Libraries.

MobileNet-V1-Model Implementation From Scratch ⊘
This project implements the MobileNetV1 model using PyTorch from scratch, a lightweight convolutional neural network
architecture designed for mobile and embedded devices. Then to train it on the CIFAR-10 dataset, which consists of
60,000 images across 10 classes.

Adam, Adagrad and RMSProp optimizers Implementation From Scratch ⊘
This practical work involves developing a Python program to implement accelerated gradient descent methods with
adaptive learning rates, specifically Adagrad, RMSProp, and Adam, for linear regression of a set of data points. These
algorithms aim to optimize the learning process by dynamically adjusting the learning rate based on the gradients of the
loss function, leading to faster convergence and improved performance

** Please refer to GitHub account for all projects and further details ⊘