Ahmed Osama Alkadi

Mechanical Engineer

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PROFILE

I am a Mechanical Engineer with a solid foundation in engineering principles who graduated from Alexandria University, Egypt. I have practical experience with professional mechanical software tools, and my fields of interest are CFD and FEA. I also have a strong understanding of machine learning, enhanced by a nine-month AI and ML scholarship at ITI. I am 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 10/2023 – 07/2024
Information Technology Institute (ITI) 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.

Bachelor's of Science in Mechanical Engineering. 06/2015 – 07/2020
Faculty of Engineering, Alexandria University 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 11/2023 – present
Physics and Mathematics department, Faculty of Engineering Alexandria University. Alexandria, Egypt

Electric Vehicles Researcher Engineer 07/2022 – 05/2023
Mechanical Engineering Department, Alexandria University Alexandria, Egypt
Electric Vehicles Researcher, leading a team of mechanical engineers. My role was to manage the design process, investigate, and construct a cooling system for the battery system of an electric vehicle. Moveover, to sustain an optimized design using CFD modeling. 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 04/2023
Journal of Energy Storage Volume 62, 106832 Alexandria, Egypt
"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 -using CFD modeling- 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 07/2022 – 10/2023
Metito Water Treatment Company Cairo, Egypt
Worked on three international projects, collaborating with multidisciplinary teams in Tunisia and Algeria and on various projects in Egypt. My role was to set the plant's General Arrangement, design the piping system and treatment processes, and integrate with other departments.

SKILLS

CFD and Finite Element Analysis (FEA)
Ansys fluent/ Structure

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

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

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.

AWS Cloud
AWS Academy Cloud Foundations Certified

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, CFD, FEA, and manufacturing in LYCANS team.

LYCANS Facebook Page

My journey with Lycans:
LYCANS team participated in SAE aero design West 2022 in California, USA. Among more than 47 teams worldwide, LYCANS ranked 4th overall.
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

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

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