

Ahmed Khaled *Senior Machine Learning Engineer | Senior Software Engineer*

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🔄 Mysterious588

Profile

Senior Software Engineer with extensive experience in building large-scale, high-performance software platforms deployed across the United States and serving hundreds of thousands of users. Specializes in scalable architectures, system design, and efficient deployment strategies. Proven success in delivering impactful solutions across industries such as robotics, enterprise applications, and advanced AI systems, with a focus on reliability, innovation, and seamless integration.

Education

Computer & Systems Engineering Bachelor's Degree, Zagazig University 07/2017 – 07/2022

- Grade: **Very Good** with honors, ranked **top-10**
- **Graduation project:** augmented reality with AI mobile tour guide supported by Orange's ODC ☑
- Assisted in Drowsiness Detection Graduation Project using deep learning, dataset creation, and OpenCV ☑
- Headed wearable exoskeleton robot 5 members' Graduation Project software team, published a research paper, and went through 3 startup campaigns: Elnekhely, Mist El Khir, Military Technical College, and exhibited at EED

Professional Experience

Senior Machine Learning Engineer, Sword Egypt, 4insite ☑ 01/2024 – present
California, Sacramento, United States

- Engineered advanced Machine Learning Systems & Architectures for image captioning, object detection, and **MLOps** pipelines decreasing the train time to only 12 minutes.
- Integrated **Amazon Sagemaker Ground Truth, Label Studio, Amazon Rekognition, and YOLOv8**, automating large-scale system training with precision achieving mAP50 of over 90%.
- Incorporated **LLM** like Gemini for both **image captioning** and **summarization**, enhancing AI capabilities with **prompt engineering** and achieving over 90% classification accuracy.
- Designed and implemented an efficient Sagemaker continuous training pipeline utilizing **step functions, training jobs, processing jobs, and S3**, optimizing workflow and replacing Gemini entirely and drastically saving cost.
- Established serverless endpoints using **Sagemaker endpoints** and **lambda functions**, achieving significant cost-efficiency.
- Successfully launched a product in airports, managing and processing over **50,000 images daily**.
- Conducted continuous R&D on emerging AI technologies, including Retrieval-Augmented Generation (RAG).
- Collaborated with 4insite, providing solutions for SBM, a company with a valuation exceeding a **billion dollars**.

Machine Learning Freelancer, Upwork ☑ 11/2020 – 01/2024
Remote

- **5-star** rated rising talent with 100% completion rate
- **Project:** developed a face detection and classification system deployed as a lightweight tf-lite model on Raspberry Pi achieving an inference time of 10 seconds
- **Project:** utilized generative data algorithms using variational autoencoders (VAE) for an auto data science Python library with 1000+ contributors
- **Project:** conducted a machine learning system with Dlib CNN face recognition model on a private network through PC, Android, and inferred through Raspberry Pi operated on a robot

Machine Learning Intern, DevisionX ☑ 09/2020 – 11/2020
Cairo, Egypt

- Utilized 3 Auto Machine Learning tools: **Auto Keras, Keras Tuner, and Optuna** on the classification of the imbalanced casting dataset (1300 industrial images) achieving the most accuracy with Keras Tuner
- Compared the outcomes of 4 hyperparameter optimization algorithms: **TPE, CMA-ES, random, and grid search** discovering that random search performs better

- Set up 2 object detection tools: **YOLOv5, and Detectron2** trained on a cigarettes COCO-based dataset and then compared the MAP concluding that detectron2 had better precision but lower inference time

Co-Founder & Electrical Team Lead, BioExoS

08/2018 – 02/2020
Cairo, Egypt

- Initiated market research and developed innovative business models that shaped the startup's growth strategy.
- Spearheaded the software design for a groundbreaking Exoskeleton robot, ensuring seamless functionality and user experience.
- Delivered compelling pitch presentations, successfully securing interest and support from key stakeholders.
- Applied expertise in Python, C++, and the Robot Operating System (ROS) to drive the company's core product development.

Chairman & Electrical Team Leader, IEEE Robotics & Automation Society

08/2017 – 08/2019
Zagazig, Egypt

- Directed the development of over 20 robots for competitive and educational purposes, elevating the chapter's technical capabilities.
- Achieved 7 victories in local robotics competitions, while also representing the chapter in international contests such as the global Minesweeper competition.
- Conducted hands-on electronics workshops, fostering skill development among college students and cultivating a passion for robotics. *Skills: Robotics, Python, C++, Robot Operating System (ROS)*

Skills

Machine Learning

LLMs, Scikit-learn, ML algorithms, MLOps, Ensemble Methods, Optimization, Pre-processing, Augmentation, Evaluation Metrics

Deep Learning

FNN, CNN, RNN, LSTM, GAN, Transformers, Transfer Learning, Regularization, Hyperparameter Optimization

Programming Languages

Python, R, C, C++, Java

Deployment


AWS, Edge Computing, RPI, AVR, ARM, ONNX, TinyML, Serverless, Lambdas, Sagemaker, Step Functions, MLOps

Certificates

Deep Learning Nanodegree - Udacity

Won Bertelsmann scholarship of Top 300 of 15,000 students

Machine Learning Introduction Nanodegree - Udacity

 Applied machine learning and deep learning algorithms on 4 projects

Cloud Development Nanodegree - Udacity

Applications of AWS, EC2, IAM, S3, Lambda, K8s, CI/CD

Deep Learning Specialization - Coursera

5-courses carried out by AndrewNG

Tools and Frameworks

- TensorFlow, Keras, PyTorch, ML.NET
- KerasTuner, Optuna, AutoKeras
- Raspberry Pi, AVR, ARM, Android
- Travis CI, Kubernetes, Docker, AWS
- Git, GitHub, Jira
- MLFlow
- OpenCV, Dlib, Numpy, Pandas
- YOLO, COCO, Detectron2
- Firebase Realtime Database
- Linux, Bash, CLI
- GPT4, Claude 3, Gemini
- LangChain, RAG

Software Engineering

Operating Systems, Design Patterns, Clean Code, Clean Architecture, Algorithms, Data Structures, Version Control, Database Design, Networks, Information Technology

Startups

Innovation, Business Models, Pitching Presentations, Business Requirements

Mathematics

Linear Algebra, Calculus, Statistics

Data Analysis and Visualization

Practical Statistics

Advanced Data Analysis Nanodegree - Udacity

Statistical analysis, A/B tests, sampling, exploring, transforming and visualizing datasets

Computer Vision Nanodegree - Udacity

Projects: image captioning, facial key-point detection with CNN, LSTM

Mathematics for Machine Learning - Coursera

3-courses specialization in linear algebra, calculus, PCA

Projects

Image captioning, *Computer Vision Nanodegree* [↗](#)

- Captioned COCO-trained two-input model, one for word embedding and another for Image classification using LSTM and CNN

Facial Keypoint Detection, *Computer Vision Nanodegree* [↗](#)

- Processed input faces with regression and CNN algorithms resulting in 78 points describing the location of facial key points

Sudoku PIX2PIX Deep Learning solver

- Accelerated a 99% accuracy algorithm that takes the 9x9 grids in one shot
- Expedited the regular CNN algorithms that predict 81 separate outputs into only one output

Facial GAN generation, *Deep Learning Nanodegree*

- Train an architecture of Generative Adversarial Network on public actor faces dataset

Drowsiness Detection, *Automotive Safety System* [↗](#)

- Extracted a dataset of facial open/closed eyes resulting in a 1000-image dataset
- Adapted transfer learning algorithms to achieve a 99% accuracy in the classification stage of the cropped eyes

Volunteering

Google DSC Zagazig University, *Co-Founder*

- Conducted live AI sessions with 100+ participants

09/2020 – 10/2021
Zagazig, Egypt

Google-ALC Mentor, *Software Engineer*

- Mentored 36 students
- Initiated and conducted design pattern sessions using Java for Google exam preparation

02/2020 – 10/2020
Remote

IEEE Robotics and Automation Society, *Chairman*

- 7 out of 9 pursued competitions were won only in the 2020 season
- 20+ constructed robots utilizing AI, ROS, Kalman filters, and embedded hardware

08/2018 – 08/2020
Zagazig, Egypt