Mahmoud **ALI**

Computer Vision Engineer · Machine Learning Engineer

Grenoble, France

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Education

École Centrale de Lyon [LIRIS Lab]
Lyon, France

PhD student in Computer Vision and Robotics — *2022 - 2024*

- PhD thesis: Perception and scene understanding

Université Grenoble Alpes [Ensimag - Grenoble INP]
Grenoble, France

MSc. in Computer Graphics, Vision and Robotics [MoSIG program] — *2020 - 2021*

- Tahtawi Scholarship 2020

Université de Bourgogne [VIBOT program]
Dijon, France

MSc 1. in Computer Vision and Robotics — *2019 - 2020*

- Total Grades: Good 14.7/20 with rank: 7/29

Faculty of Computers and Information Science, Ain-Shams University
Cairo, Egypt

Pre-Master [Post-graduate] in Computer Science — *2017 - 2018*

- Total Grades: 3.3/4

Faculty of Computers and Information Science, Ain-Shams University
Cairo, Egypt

BSc. in Computer Science — *2012 - 2016*

- Total Grades: Good 72.5 and Graduation Project: Excellent

Work Experience

Laboratoire Hubert Curien - Université Jean Monnet
Saint-Etienne, France

COMPUTER VISION RESEARCHER — *Oct. 2021 - Jan. 2022*

- FA4.0 (Failure Analysis 4.0) develop a complete pipeline for failure diagnostic of electronic devices.
- Generate databases of synthetic A scanning electron microscope (SEM) images, with ground truth having a realistic geometry, associated with the experimental contexts of the project.
- Comparison of the quality of the simulation methods (Monte-Carlo method and Deep Learning based methods).
- Denoising the scanning electron microscopy images using different filters (NLM, Bilateral, Total variation (TV), BM3D).

INRIA [MORPHEO Team]
Grenoble, France

COMPUTER VISION RESEARCHER — *Feb. 2021 - Aug. 2021*

- Study Automated General Movements Assessment by Clustering Motion Words from Infants Motion Sequences.
- Develop system to detect Cerebral Palsy problem earlier in the infant in age 3 -5 months.

Datathon DATACARE-COVID19
Dijon, France

COMPUTER VISION DEVELOPER,[COVID-19 SYSTEM] — *Apr. 2020 - Apr. 2020*

- The goal of this system is to discover the normal states of the slides to be scanned And the pathological cases, and among the cases, to detect the patients From Covid-19. Using the data available will be one or more pivoting sections Chest x-ray in the lungs, and in this system we work to classify the Chest x-ray which have COVID-19 and segment the position of the disease in the lung and the accuracy to detect and Identify the disease through Chest x-ray. Tools: Python, Medical image, Deep learning, Keras, skikit-learn.

DevisionX
Cairo, Egypt

MACHINE LEARNING ENGINEER — *Nov. 2018 - July. 2019*

- Worked on project to identify the Egyptian national id from images, The output was to recognize the text in it as Arabic using OCR and Another output is to compare the person holding the ID with the image of the ID using Face Detection.Tools: Python, Deep learning, Keras, skikit-learn.

Hackathon Vodafone-010
Cairo, Egypt

COMPUTER VISION DEVELOPER, [Verified & anti-spoofing Project] — *Dec. 2018 - Dec. 2018*

- A spoofing attack is an attempt to acquire someone else's privileges or access rights by using a photo, video or a different substitute for an authorized person's face. Tools: Python, Dlib, OpenCV, Deep learning.

Egyptian Engineering Day (EED) competition
Cairo, Egypt

Software Engineer, [Kinect-Based Map Building for Robot Navigation] — *Sep. 2016 - Sep. 2016*

- Building a consistent map of the indoor environment by guiding the robot to move and incrementally builds the map. We proposed a method to convert the Kinect's 3D depth data to a 2D area map. Our method can detect obstacle which is missing in a normal laser scan system.
- Tools: C#, LabVIEW, Microsoft Kinect camera, Project URL: https://www.youtube.com/watch?v=EarvxhsyT4E .

Skills

Programming	Python, C#, C++, C, MATLAB, Julia, LaTeX
Development Tools	Git, IBM Watson, AWS, Docker, Microsoft Kinect Camera, Raspberry pi
OS	Windows, Linux (Ubuntu)
Languages	English, Arabic, French A1

Projects

Control GAN *PyTorch*

CelebA dataset

- Implement a GAN controllability method using gradients from a classifier. By training a classifier to recognize a relevant feature, you can use it to change the generator's inputs (z-vectors) to make it generate images with more or less of that feature.

Chest X-ray image classification *Python, Keras*

ChestX-ray8 dataset

- Use transfer learning to retrain a DenseNet model for chest X-ray image classification and handle class imbalance then visualize model activity using GradCAMs to produce a heatmap highlighting the important regions in the image for predicting the pathological condition.

Left Ventricle Segmentation in Heart *Python, Keras*

ACDC dataset

- Build a deep learning models [U-net, FCN] that automates left ventricle segmentation with high accuracy. The output of the model is a segmentation mask, a pixel-by-pixel mask that indicates whether each pixel is part of the left ventricle or the background.

Zombie Detection *Python, Tensorflow*

- Use the Object Detection API and retrain RetinaNet to spot Zombies using just 5 training images.

Autonomous driving - Car Detection *Python, Tensorflow*

COCO dataset

- Using YOLO, Faster RCNN algorithms for car detection in image and video. It's an object detector that uses features learned by a deep convolution neural network to detect an object.

Objects Instance Segmentation *Python, PyTorch*

COCO dataset

- Using Pretrained model Mask-RCNN trained on COCO dataset which contains 85 class to detect and segment objects in the scene.

American Sign Language (ASL) *Python, Keras*

- (ASL)is the primary language used by many deaf individuals in North America, train a convolution neural network to classify images of letters.

Tracking object (Mario) in Video *Python, OpenCV, Multi-threading*

- Search for an object in a video using OpenCV (Template Matching) function and tracking it by drawing rectangle around it. Optimize the time using parallelism (Multi-threading Model).

Offline City Map [Le Creusot, France] *C++, QT*

Link: https://bitbucket.org/Joako1991/offlinemap-project/src/master/

- The goal is to make an offline version of a mix between Trip Advisor (user opinions and places reputations) and Google maps (have a map and a way to go to any place). The constrain is to only do it for Le Creusot City.

Computational Geometry and Digital Signal Processing [DSP] Packages *C#*

- Apply different algorithms on Shapes to study the Geometric shape. (Convex hull algorithms, Triangulation algorithms, Voronoi algorithms).
- Analysis and representation of digital signal in both time and frequency domain, including discrete-time convolution, the z-transform, more about other transforms and the discrete-time Fourier transform, FFT algorithm for computation of the DFT algorithm.

Image Processing and Features Packages *MATLAB, Python*

- This package included Histogram equalization, Convolution, HARRIS CORNER, k-means clustering and Morphological Transformations.
- Comparative Analysis for Features-Detection-Description-and-Matching of SIFT, SURF, AKAZE, ORB, BRIEF and BRISK Algorithms .
- Implemented HOG algorithm from scratch which mainly used to describe the structural shape and appearance of an object in an image .

Honors & Awards

2020 **Tahtawi Scholarship,** Scholarships are available to Egyptian students to study master degree in France. *Campus France*