SABIR Ilyass

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Computer vision, artificial intelligence, machine learning, data science, and medical imaging.

Education

Generalist Engineer Degree in Digital Engineering. Télécom Saint-Étienne, Saint-Étienne, France
Specialization *: Image and Computer Science.* *September 2020 – Today*
Option *: Advanced Image Processing and Biomedical Imaging.*

Preparatory classes for engineering schools. My Abdellah High School, Safi, Morocco.
Field of study *: Mathematics, Physics, and Engineering Sciences* *September 2017 – June 2019*
Results *: Admission to Mines-Télécom, Centrale, and CCINP*
Eligibility for admission to École Polytechnique (l'X).

Professional experiences

Research Engineer Intern Astek, Boulogne-billancourt, France
Final-year internship *March 2023 – Today*

- Performance measurement of 3D mapping reconstruction from multiple cameras based on the number and size of adherent raindrops.
- Performance measurement of 3D mapping reconstruction from two cameras by leveraging vehicle motion, based on the number and size of adherent raindrops.
- **Skills and tools**: Python, OpenCV, scientific research, scientific report writing, 3D imaging, applied mathematics.

Research and innovation project Cadeau Maestro, Saint-Étienne, France
October 2022 – January 2023

- Designing a machine learning model for suggesting gifts to users.
- The user responds to a list of questions, and based on their answers, a gift is suggested to them.
- In such cases where the questions may be insufficient to meet the client's expectations, it is crucial to improve the questions posed to the user until they are satisfied with the gift recommendation.
- **Skills and tools** : Python, Scikit-Learn, research, data cleaning, Keras, Random Forest, Qt.

Engineering project Irudigi, Saint-Étienne, France
Introduction to research. *May 2022 – June 2022*

- Generation of synthetic scans from MRI (Magnetic Resonance Imaging).
- Comparison of methods for generating a scan from an MRI based on recent studies in deep learning.
- **Skills and tools** : Python, medical imaging, Keras, GAN (Generative Adversarial Networks), GitHub.

Java Developer Amiltone, Saint-Étienne, France
Software project. *October 2021 – January 2022*

- Development of an automatic arbitration application for foosball matches.
- **Skills and tools** : Java, computer vision, GitLab, OpenCV, Java.

Academic projects

Ray tracing project | *GitHub*

- Implementing a ray tracer capable of rendering a collection of opaque spheres with effects such as shadows, reflections, textures, and a bounding volume hierarchy acceleration structure.
- **Skills and tools** : Ray tracing, C++, computational geometry, algorithmic complexity.

Texture synthesis in ultrasound imaging | *GitHub*

- Analysis of different texture generation techniques and their application to visible samples in ultrasound imaging to evaluate their effectiveness.
- **Skills and tools** : Python, MATLAB, Pytorch, OpenCV, PySide, image Quilting, neural Transfer, co-occurrence Based texture Synthesis.

Facial morphing from a sequence of images. | *GitHub*

- Development of facial morphing software using image alignment techniques.
- **Skills and tools** : Python, SimpleITK, image alignment.

Skills

Image processing and computer vision: Mathematical morphology, pattern recognition, texture analysis, deconvolution, image synthesis, image alignment, 3D image processing, graph cuts, biomedical imaging.

Signal processing: Random signals, Fourier transform, Z-transform, wavelet transform.

Machine learning: Regression, classification, clustering.

Deep learning: ANN, CNN, RNN, SOM, GAN, U-NET, Diffusion model, Boltzmann machine, autoencoders.

Reinforcement learning: Q-learning, Deep Q-learning, A3C.

Applied mathematics: Linear algebra, general algebra, probability and statistics, estimation, Markov chains.

Computer science: Python : PyTorch, TensorFlow, Keras, OpenCV, OpenGL, Scikit-Learn, C++, MATLAB, R, Java, JavaScript, Git.

Strength: Problem-solving, autonomy, project management, teamwork, responsibility, organization.

Languages: **French**: Fluent, **English**: Professional proficiency, **Arabic**: Native, **German**: Basic knowledge.

Volunteer experiences

Volunteer educational speaker

Science communication: Explaining scientific concepts about the universe and the solar system to elementary school children.

Volunteer tutor in mathematics and physics

Since 2020, I have assisted over 100 students, mainly from Africa, in mathematics and physics to prepare them for engineering school entrance exams or end-of-year university exams.

Certificates

Computer Vision In Python! Face Detection and Image Processing | *Udemy*	September 2022
Intelligence Artificielle de A à Z | *Udemy*	August 2022
Le Deep Learning de A à Z | *Udemy*	August 2022
Python for Machine Learning: The Complete Beginner's Course | *Udemy*	August 2022
Python for Deep Learning: Build Neural Networks in Python | *Udemy*	August 2022
Python Demonstrations For Practice Course | *Udemy*	March 2022
150+ Exercises - Object Oriented Programming in Python - OOP | *Udemy*	May 2023

Interests

Mathematics:

* JI write mini articles on mathematics. *[1]*.
* I generalize problems from international mathematics Olympiads, including a generalization of problem 1 from the IMO 2021, day 1 *[2]*, Generalization of USA Math Olympiad 1998. *[3]*.
* I correct written mathematics exams for competitions such as X-ENS and the external aggregation in mathematics, including the correction of the algebra test for the external aggregation competition 2019*[4]*
* I have written a 58-page book *[5]* that presents a detailed proof of Dirichlet's theorem. This theorem states that there are infinitely many prime numbers of the form $an + b$, where a and b are integers that are coprime.

Coding problems: Project Euler.

* I solve mathematical/computer science problems from Project Euler. *[6]*.