

SELF INTRODUCTION

Driven by a passion for computer science, I received a BS in Mathematics and Computer Science from the University of Ibn Zohr and a Master of Research in Data Science. Currently, I'm a Research Fellow at Henry M. Rowan College of Engineering, Rowan University, collaborating with the Federal Aviation Administration on aviation safety projects using advanced machine learning algorithms. I am a Kaggle Notebook Expert and I am a recognized public speaker in Machine Learning, with a broad experience in software and electrical engineering and a specialization in Deep Learning and Machine Learning Engineering, particularly in Multimodality Bridging, Representation Learning, Self-Supervised Learning, and Generative AI.

EDUCATION

- **MS Electrical and Computer Engineering**, *Rowan University - Henry M. Rowan College of Engineering, USA* Jan 2023 – June 2024
- **Master of Research in Data Science**, *Ibn Zohr University - Faculty of Sciences Agadir - Morocco* July 2022
- **BS in Mathematics and Computer Sciences**, *Ibn Zohr University - Faculty of Sciences Agadir - Morocco* Sept 2020

SKILLS

Tools	Git, LATEX, WandB
Programming Languages	Python, C++, JS, Java, C, Kotlin
Frameworks & Libraries	TensorFlow, Keras, Pytorch, Jax, scikit-learn, HuggingFace, Flask, ExpressJs, Angular, Django, Android
Cloud	AWS, GCP, Jupyter, Docker, Kubernetes
MLOps	Git, GitHub, WandB, TFX, KubeFlow
Quantitative Research	Mathematical Optimization, Mathematical Modeling, Advanced Probability, R, SQL
Communication	English (130 DET), Moroccan Arabic (Native), Arabic (Native), Tamazight (Native), French (B2)

SCHOLARSHIPS AND AWARDS

- **Rowan Research Fellowship Award** 01/2023 - Rowan University
- **Google Scholarship: Professional Certificate** 03/2022 - Google
- **Google Scholarship: TensorFlow Certificate** 12/2021 - Google

CERTIFICATES

- **Google Data Analytics Professional Certificate** *Data Analysis / R / Spreadsheets / Tableau* 03/2022 - Google
- **TensorFlow Developer Certificate** *Deep Learning / TensorFlow / MLOps* 12/2021 - TensorFlow.org
- **Deep Learning Researcher** *Data Science / Deep Learning / Machine Learning* 09/2021 - Workera.ai
- **Software Design and Architecture** *Software Architecture / Design Patterns / UML* 10/2020 - University of Alberta
- **Software Product Management Specialization** *Scrum / Agile / Product Management* 08/2020 - University of Alberta
- **Deep Learning Specialization** *Python / TensorFlow / Deep Learning* 07/2020 - deeplearning.ai

PUBLICATIONS

- **GeoArgania: A Geolocation Mapping Dataset of Argania Trees in the Souss Region** - 2nd
- **Cost-Effective Pavement Management System for Municipal Road Networks** - 3rd
- **Atmospheric Visibility Estimation: A Review of Deep Learning Approaches** - 3rd
- **Atmospheric Visibility Image-Based System for Instrument Meteorological Conditions Estimation: A Deep Learning Approach** - 1st
- **Argania Forest Change Detection from Sentinel-2 Satellite Images Using U-Net Architectures** - 2nd

EXPERIENCE

- **Teaching Assistant / Intro to Embedded Systems** 01/2023 — 05/2024
Rowan University
 - C / Embedded Systems / Altium / PCB Design
- **Adjunct Faculty / Cyber Security Lecturer** 09/2023 — 05/2024
 - Delivered engaging lectures using effective teaching methods to promote student understanding.
 - Designed interactive assignments and labs to reinforce key cybersecurity concepts and foster practical application.
 - Developed comprehensive examinations to assess student knowledge and learning outcomes.
 - Maintained consistent grading standards to ensure the fair and accurate evaluation of student performance.
 - Effectively managed a team of teaching assistants, providing guidance and support for their instructional roles. Rowan University
 - Created tailored course syllabi aligned with industry standards and learning objectives.
 - Delivered engaging lectures using effective teaching methods to promote student understanding.
 - Designed interactive assignments and labs to reinforce key cybersecurity concepts and foster practical application.
 - Developed comprehensive examinations to assess student knowledge and learning outcomes.
 - Maintained consistent grading standards to ensure the fair and accurate evaluation of student performance.
 - Effectively managed a team of teaching assistants, providing guidance and support for their instructional roles. Rowan University

- Latex / Public Speaking / Cyber Security / Python

– **ML Graduate Research Fellow / In-Flight Atmospheric Visibility Estimation using Multimodal Data**

01/2023 — 06/2024

- Utilized X-Plane to create a comprehensive dataset for in-flight visibility estimation.
- Employed multimodal fusion techniques to build an efficient and reliable machine learning model for in-flight visibility estimation.
- Presented weekly project updates highlighting advancements and progress.
- Authored research papers contributing to the field of modality fusion. Rowan University - Federal Aviation Administration - Developed a cutting-edge multimodal system for in-flight atmospheric visibility estimation (collaboration with Rowan University and US Federal Aviation Administration).
- Utilized X-Plane to create a comprehensive dataset for in-flight visibility estimation.
- Employed multimodal fusion techniques to build an efficient and reliable machine learning model for in-flight visibility estimation.
- Presented weekly project updates highlighting advancements and progress.
- Authored research papers contributing to the field of modality fusion.

Rowan University - Federal Aviation Administration

- Python / TensorFlow / Jax / TFX / Flask / WandB

– **ML Research Engineer / Argania Forest Change Detection from Sentinel Satellite**

09/2022 — 01/2023

In this role as a Machine Learning Engineer, I contributed to the critical task of detecting forest changes, particularly deforestation, in the Argania forests using Sentinel-2 satellite data. My responsibilities included problem formulation, dataset collection, and developing change detection models using Python, TensorFlow, Keras, Transformers, and CNN architectures. Additionally, I integrated the use of WandB to optimize the research process and enhance the accuracy of our results.

IRF-SIC Laboratory

- Python / TensorFlow / Keras / Transformers / CNN / WandB

– **ML Researcher Intern / Argania Forest Change Detection from Sentinel Satellite Images using U-Net**

02/2022 — 07/2022

As an intern at IRF-SIC laboratory, I played a pivotal role in the development of a CNN-based U-Net model for change detection in Argania forests. My responsibilities encompassed problem framing, model structuring, and implementation. Python, TensorFlow, U-Net, and CNN techniques were key components of this project, with WandB facilitating the research process.

IRF-SIC Laboratory

- Python / TensorFlow / U-Net / CNN / WandB

– **ML Researcher Intern / Atmospheric Visibility Image-Based System for IMC Estimation**

02/2022 — 07/2022

During my internship at Rowan University, I delved into the development of an atmospheric visibility estimation system using RGB image-based approaches. My contributions ranged from in-depth research and problem framing to dataset requirements, model development, training, and evaluation. Python, TensorFlow, CNN, Vision Transformers, and WandB were integral to this project. Furthermore, I employed explainability tools such as GRAD-CAM to gain insights into the model's decision-making process.

- Python / TensorFlow / CNN / Vision Transformers / WandB

Rowan University - Federal Aviation Administration

– **Fullstack Engineer Internship: SAHEM: Design And Full Stack Development Of A Crowdfunding Platform**

2/2020 – 5/2020

As a full-stack engineer, I undertook the design and development of a crowdfunding web application called SAHEM. Leveraging the MEAN stack, I employed MongoDB, Express.js, Angular 9, and Node.js to create a robust and user-friendly platform. My work included integrating Stripe API for secure payment processing, enhancing the user experience, and ensuring smooth functionality.

- MongoDB / Express.js / Angular9 / Node.js

Ibn Zohr University

– **Fullstack Engineer Consultant**

2/2016 – 7/2020

As a full-stack engineer consultant, I collaborated with various companies to design, develop, and scale web and Android applications. I optimized the architecture of numerous web applications, bolstering their security measures to prevent data breaches. My work also involved ensuring high-quality code that adhered to best practices and software design principles.

- Web Dev / JS / Python / Java

Freelance

PROJECTS

– **Bookmark AI: AI-Powered Chrome Extension for Searching and Prompting Bookmarked Pages**

09/2023

I developed and released a Chrome extension named 'BookmarkAI,' which revolutionizes the way you interact with your browser's bookmarked pages. Unlike typical browser functionalities that limit you to searching only the titles of your bookmarks, BookmarkAI takes it several steps further. It enables a unique feature where you can 'chat' with your bookmarked pages, allowing for a more dynamic and interactive search experience. Additionally, BookmarkAI offers an advanced content analysis tool, which scrutinizes and compares information across different bookmarked pages. This proves particularly beneficial for academic or research purposes, as it assists in synthesizing and composing sections like the 'related works' in your research papers, drawing directly from the content of the selected bookmarked pages. BookmarkAI isn't just a search tool; it's a smart assistant that enhances your browsing and research experience.

github.com/skywolfmo

- Python / LLM / Gemini Pro / HuggingFace / Chrome / JS / RESTful API

- **ML System / Face Recognition Search Engine AI System with TF, TFjs, Keras, and Flask** 09/2023
 I created a Face Recognition Search Engine AI System designed for user-friendly operation. The system begins by detecting all faces in a user-provided image, entirely on the client side. It then prompts the user to select the specific face they want to search for. Once the user selects a face, the system sends it to the server for encoding and retrieval. The selected face is encoded into a compact vector representation on the server side. The system then retrieves and presents the top 10 faces from the database that closely resemble the selected face by comparing the distance between the encoded face input with the faces available in the database, along with associated personal information. github.com/skywolfmo

 - Python / OpenCV / Tensorflow / Flask / TFjs / Keras / RESTful API
- **ML System / Tamazight Language OCR System** 06/2023
 I developed an OCR application tailored specifically for the Tamazight language. The project began with the implementation of an object detection approach for the detection and transcription of text. Subsequently, I leveraged a custom-trained OCR model, which I meticulously crafted from a curated dataset. I encapsulated these components within a RESTful API to ensure seamless integration, establishing a crucial link with our front-end application. github.com/skywolfmo

 - Python / OpenCV / Tensorflow / Flask / Django / RESTful API
- **ML System / Parking Building Monitoring system using Object Detection and OCR** 06/2023
 I have designed and developed a Parking Building Monitoring System that is fully functional. This system employs cutting-edge Object Detection models trained on publicly available datasets to create a Flask API. Initially, the API extracts the cars detected from live CCTV video frames. For each car, the different faces inside the car are extracted and stored in a database along with the car's license plate. Furthermore, I have created a user-friendly dashboard web application using Django, which enables efficient management and visualization of the collected data within the building. github.com/skywolfmo

 - Python / OpenCV / Tensorflow / Flask / Django / RESTful API
- **Open Source / Computer Vision / polyroi for ROI selection and manipulation** 07/2021
 I created a robust Python module designed for the selection of polygonal regions of interest (ROI) within images. This module was invaluable for subsequent ROI manipulation tasks and contributed to data augmentation for Object Detection. There have been approximately 8,000 downloads so far. github.com/skywolfmo

 - Python / OpenCV / Numpy / OOP
- **Open Source / Computer Vision / Medical Videos / Vertebrate Tracker with Particle Filter** 07/2021
 Within this project, I conceived and developed a tool for tracking multiple vertebrae in medical videos. I implemented the particle filter method in conjunction with the polyroi package, employing object-oriented programming principles to enhance its functionality. github.com/skywolfmo

 - Python / polyroi / OpenCV / Numpy / OOP
- **ML for Web / Ini7a: Entertainment web application using PoseNet and Tensorflow Js** 01/2020
 This was my first ever ML project where I fine-tuned PoseNet to power an engaging web application. This unique entertainment platform is designed to match specific music with each pose in traditional Moroccan Cultural Dance. Leveraging brain.js, ml5.js, and tensorflow.js. github.com/skywolfmo

 - brain.js / ml5.js / tensorflow.js / pl5.js

LEADERSHIP AND VOLUNTEERING

Founder/Lead Community Organizer	08/2023 — Present — MLNomads
Machine Learning Public Speaker	07/2021 – Present – DevMENA Youtube
Mentor	07/2022 – 07/2023 - Google Developers
Founder / Lead Organizer at TensorFlow User Group	11/2021 – 2/2023 – Google Developers
Founder / Lead of Google Developer Student Clubs	07/2021 – 07/2022 – Google Developers
Founder / Lead of Computer Science Students Club	10/2019 - 07/2021 – Faculty of Sciences Agadir