Abdelmouhaimen Sarhane

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Skills

Skills: Python, C++, SQL, PyTorch, OpenCV, ROS2, OpenGL, MLFlow, Flask, GCP, BigQuery, PowerBI
Soft Skills: Problem-solving, Curiosity, Adaptability, Communication, Collaboration
Languages: French (Bilingual), English (Bilingual), Arabic (Native)

Experience

Renault Group (Ampere Software Technology) — Toulouse, France
AI Research Intern - Semantic Scene Perception — *March 2025 – October 2025*

- Contributed to the development of an AI-based driving assistant system for scene understanding and risk detection.
- Adapted and fine-tuned pretrained models on driving-specific datasets, achieving a 94% accuracy in risk detection.
- Currently working on embedding the model pipeline into an edge-inference module for deployment in low-power in-vehicle units using ONNX Runtime and TensorRT.
- Authoring an internal report and potential publication on behavior-aware scene understanding for intelligent vehicles.

IRIT — Toulouse, France
Computer Vision & Embedded Systems Developer — *Oct 2024 – Mar 2025*

- Designed a system for adaptive image sampling and reconstruction using compressed sensing and deep learning.
- Implemented two networks: NetM for mask generation and NetE for inpainting-based reconstruction.
- Optimized bandwidth usage in drone-based transmissions; added real-time refinement loop.
- Developed a Streamlit dashboard for interactive monitoring and visualization.

GET-OMP (CNRS) — Toulouse, France
Deep Learning Intern - Satellite Image Processing — *Jun 2024 – Sep 2024*

- Developed U-Net with attention to detect water bodies in West Africa from Landsat satellite imagery.
- Achieved 94% F1-score through preprocessing and prediction optimizations.
- Performed temporal analysis from 1984–present for hydrological insights.
- Integrated NDWI and MNDWI indices in geospatial pipelines with GDAL and QGIS.

ENAC — Toulouse, France
HPC and Data Analysis Intern — *Jun 2023 – Jul 2023*

- Assessed energy consumption of matrix computations on compressed data & Co-authored a paper accepted at ICT4S 2024.
- Built efficient C++ workflows for scientific computing with energy monitoring. (Blaz compressor, PowerJoular)
- Applied advanced compression to sports data heatmaps, reducing compute overhead by 25%.

Education

INP-ENSEEIHT | **Toulouse, FR** — *September 2022 – October 2025*
MSc Master of Science — Digital Sciences Engineering Diploma: Image and Multimedia — ***GPA: 3.92/4.0***

CPGE Saint-Benoît | **Angers, FR** — *September 2020 – July 2022*
Preparatory Classes MPSI/PSI (Maths/Physics)

Projects

AI-Powered Clinical Documentation & Patient Chatbot Platform *Entrepreneurial Project*

- Automated transcription of medical visits into structured reports, including prescription summaries and care advice
- Implemented patient-specific chatbot using RAG over all patient documents (scans, history, prescriptions)
- *Technologies Used: Docker, Kubernetes, RabbitMQ, FastAPI, AWS S3 (SSE-KMS), PostgreSQL, React*

Multimodal Data Processing Projects *(ENSEEIHT)*

- Image stitching: SIFT, homography estimation, KLT tracking.
- Segmentation: K-means, SLIC superpixels.
- Source separation: NMF, U-Net audio models.
- 3D streaming: compression, remeshing, camera pose estimation, 3D rendering
- 3D Inverse Problems: SfM, MVS, Shape-from-shading, stereo photometry.

3D Projector Pose Adjustment | *GitHub*

- Developed a computer vision system to align prehistoric paintings onto a replica of the Chauvet Cave.
- Used Structure-from-Motion (SfM) and Multi-View Stereo (MVS) to reconstruct a 3D model of the replica.
- Calibrated projectors using Zhang's method (treated as inverted cameras) and applied ICP for alignment.
- Enhanced projection accuracy and minimized manual positioning errors.

Customer Behavior Analysis System | *GitHub*

- Developed real-time tracking of customer movement in supermarkets using YOLOv8 and Roboflow.
- Generated 2D heatmaps; working on multi-camera re-identification and edge deployment (Jetson).

RAG-based Document Chatbot

- Built a conversational system combining document retrieval with generation using LlamaIndex and a local LLM.

Additional Projects: 3D Rendering Engine (JAVA), 3D Surface Compression and Remeshing using MAPS (Python), Traffic Sign Recognition using Deep Learning (Python, Tensorflow), Simplified Language Compiler(OCamL), Learning app: RevEasy (JAVA, Swing)