

# EL MEHDI HICHAM AI Engineer / Data Scientist

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## PROFESSIONAL EXPERIENCE

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| <b>Intern – R&amp;D Engineer in Computer Vision &amp; AI – Football Analytics, SPORTSCORE</b> <ul style="list-style-type: none"><li>Designed and deployed a <b>fully automated video analysis pipeline</b> for futsal matches (object detection, multi-player tracking, homography, OCR, pose estimation).</li><li>Built an <b>automatic frame classification module</b> (YOLOv11m-cls) achieving <b>99.95% accuracy</b>.</li><li>Implemented <b>complex action detection</b>: pass classification (progressive, assist, under pressure), shots, dribbles, interceptions, goals.</li><li>Optimized the pipeline, reducing <b>inference time by 20%</b> and improving ball detection robustness.</li><li><b>Supervised and trained 4 interns</b>, managing tasks, reviewing deliverables, and ensuring technical consistency.</li><li>Delivered <b>automated performance reports</b> (heatmaps, pass maps, structured JSON exports, advanced stats).</li><li><b>Tech stack</b>: PyTorch, YOLOv8/11, DeepSORT, OpenCV, OCR, Pandas, Python.</li></ul> | 04/2025 – present<br>Paris, France (Remote)  |
| <b>End-to-End Event Spotting in Videos – Engineering Intern, UNIVERSITÉ IBN TOFAIL – LABORATOIRE SETIME</b> <ul style="list-style-type: none"><li>Developed a full pipeline: frame extraction, JSON annotations, temporal normalization, data augmentation (jittering, mixup), and train/val/test split (70/15/15).</li><li>Implemented RegNet-Y with Gate Shift Modules (GSM) for feature extraction and a Bi-GRU for global temporal reasoning.</li><li>Experimented with multiple configurations (clip_len 16/50) using RegNet-Y and ResNet-50 on a 40GB dataset (7 matches from the 2024 Futsal World Cup).</li><li>Achieved a recall of 0.93 on the DRIVE class, with RegNet-Y outperforming ResNet-50.</li><li><b>Tech stack</b>: Python, PyTorch, RegNet-Y, ResNet-50, Bi-GRU, OpenCV, GPU (RTX 4060).</li></ul>   | 10/2024 – 01/2025<br>Kenitra, Morocco        |
| <b>Internship – Content Delivery Network (CDN), Orange Business</b> <ul style="list-style-type: none"><li>Developed a Shell script to generate secure URLs with token-based authentication.</li><li>Resolved a URL formatting issue and enhanced security by studying CORS headers, XSS, and CSRF attacks.</li><li><b>Tech stack</b> : Shell Scripting, JSON Web Tokens, wget.</li></ul>  | 09/2023 – 11/2023<br>Sale Al Jadida, Morocco |

## EDUCATION

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| <b>Master’s Degree in Artificial Intelligence, Ibn Tofail University</b> <ul style="list-style-type: none"><li>Machine Learning, Deep Learning, Reinforcement Learning, Natural Language Processing (NLP), Computer Vision, Generative AI.</li></ul> | 11/2023 – 09/2025<br>Kenitra, Morocco |
| <b>Bachelor’s Degree in Physics, Ibn Tofail University</b>   | 2020 – 2023<br>Kenitra, Morocco       |

## ACADEMIC PROJECT

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| <b>Autonomous Vehicle</b> <ul style="list-style-type: none"><li>Developed a <b>ROS2–Gazebo simulation pipeline</b> with URDF/xacro models, integrating camera &amp; LiDAR for obstacle detection and traffic sign recognition.</li><li>Implemented a <b>TD3 reinforcement learning agent</b> for autonomous navigation, combining trajectory planning, real-time control, and safe decision-making.</li><li>Validated the system in diverse scenarios, achieving <b>reliable path following and collision avoidance</b> in simulation.</li><li><b>Tech stack</b>: ROS2, Gazebo, Python, PyTorch, RViz, URDF/xacro, TD3 RL, Computer Vision</li></ul> | 02/2025 – 07/2025 |
| <b>Digitization of Amazigh Writings, OCR for Tifinagh Characters using Deep Learning</b> <ul style="list-style-type: none"><li>Developed an innovative Optical Character Recognition (OCR) system for Tifinagh handwritten script, with the goal of preserving and digitizing the Amazigh cultural heritage using AI.</li><li>Designed and implemented a hybrid CRNN-based model to improve the accuracy of character recognition.</li><li>Served as a Paddle OCR Developer and CNN Model Developer on the project team.</li><li><b>Tech stack</b>: Hybrid CRNN model, PaddleOCR, TensorFlow, PyTorch, OpenCV.</li></ul>                             | 10/2024 – 02/2025 |
| <b>Diabetic Retinopathy Detection</b> <ul style="list-style-type: none"><li>Developed a Deep Learning model to detect and classify diabetic retinopathy from retinal images. The primary goal was to facilitate early diagnosis to prevent vision loss and provide a diagnostic aid for ophthalmologists.</li><li>Preprocessed the APTOS 2019 dataset and implemented data augmentation techniques to create a robust model.</li><li><b>Tech stack</b>: EfficientNetB0, Convolutional Neural Networks (CNN), TensorFlow/Keras, and Adam optimizer.</li></ul>   | 10/2024 – 01/2025 |

## SKILLS

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| <b>Programming &amp; AI:</b> Python (PyTorch, TensorFlow, Keras), C/C++, Java, FastAPI, REST API, ML/DL (CNN, RNN, LSTM, Transformers).  |
| <b>Computer Vision &amp; Robotics:</b> YOLOv8/11, Faster R-CNN, DeepSORT, OCR (PaddleOCR, CRNN), Pose Estimation, OpenCV, homography, camera calibration, ROS2, TensorRT, real-time inference. |
| <b>Generative AI &amp; NLP:</b> LLMs, RAG pipelines, Hugging Face, LangChain, prompt engineering, SQL-to-NL, embeddings & vector DBs.  |
| <b>Cloud &amp; Infrastructure:</b> AWS (S3, EC2, Lambda), Docker, Linux, Shell Scripting, MLOps basics (deployment, APIs, monitoring).   |
| <b>Networking &amp; Databases:</b> TCP/IP, SQL (MySQL, PostgreSQL), NoSQL (MongoDB), Vector DBs (FAISS, Pinecone), CDN.  |
| <b>Leadership &amp; Project Management:</b> Team supervision, project planning, technical mentoring.   |
| <b>Version Control &amp; Collaboration:</b> Git, GitHub, CI/CD basics,Agile/Scrum practices.   |
| <b>Languages:</b> Arabe (Native) , French (Professional) , English (Intermediate)  |