

EL HAJ EBOU

Junior ML / Computer Vision Engineer | Medical Imaging, Deep Learning, Self-Supervised Learning

📍 Paris, Île-de-France 📞 07 59 58 62 25 ✉️ hadjteyib2@gmail.com 🌐 El Haj Ebou 🔄 hajteyib 📁 Portfolio

PROFILE

Junior ML / Computer Vision Engineer, with an engineering background in computer science and a Master 2 specialized in Vision et Machine Intelligente. Experience in deep learning applied to 3D medical imaging, self-supervised learning, and the development of complete AI pipelines, from data processing to model evaluation. Hybrid applied research / engineering profile, able to work with complex data, experiment with modern architectures, and build usable AI solutions.

EDUCATION

- **Université Paris Cité, Paris, France** Sept. 2025 – Aug. 2026
Master 2 (M2) - Vision et Machine Intelligente
- **Institut National des Sciences Appliquées de Lyon - INSA Lyon** 2024-2025
Engineering student, Computer Science Department
- **École Supérieure Polytechnique (ESP), Nouakchott, Mauritanie** 2022-2024
Engineering student in Computer Science, Networks and Telecommunications

PROFESSIONAL EXPERIENCE

Internship - Segmentation and Classification of Pulmonary Nodules on Chest CT Scans March 2026 – August 2026
AP-HP, Hôpital Saint-Louis, Paris, France

- Developed a reproducible 3D pulmonary nodule segmentation pipeline on chest CT scans, applied to a rare clinical cohort of immunocompromised patients.
- Structured and used a private dataset of approximately **200 usable cases**, including nodule annotations, clinical metadata, and DICOM/NIfTI harmonization.
- Trained and evaluated a robust guided segmentation baseline with **nnU-Net**, reaching a **mean Dice score of 0.83** on an internal held-out test set.
- Adapted **MedSAM** through parameter-efficient fine-tuning with **LoRA**, improving guided segmentation with a **mean Dice score of 0.87**, **HD95 of 1.58 mm**, and **ASSD of 0.58 mm** on the internal test set.
- Prepared the downstream component combining segmented masks, radiomics, and clinical variables for etiological classification of infectious nodules.

Technical skills : *Python, PyTorch, nnU-Net, MedSAM, LoRA, SimpleITK, DICOM/NIfTI, TCIA/LIDC-IDRI, pandas, scikit-image, Git*

Internship - Self-Supervised Learning for Handwritten Text Recognition May 2025 – September 2025
LIRIS, Lyon, France

- Designed an SSL approach for handwritten text recognition, combining contrastive learning with SimCLR and masked reconstruction with MAE/Vision Transformer on unlabeled data.
- Built a large-scale training corpus through web scraping of historical Gallica/BNF documents and synthetic data generation.
- Performed self-supervised pretraining followed by supervised fine-tuning on annotated data, with comparative evaluation against internal baselines trained directly in a supervised setting.
- Reduced the Character Error Rate to approximately **5%** after fine-tuning, with a clear improvement over internal reference models.

Technical skills : *Python, PyTorch, SimCLR, MAE/ViT, OpenCV, NumPy, BeautifulSoup*

PROJECTS

- **Brain Tumor Segmentation — U-Net, ResNet-34 & Knowledge Distillation** March 2025
Academic project — Deep Learning applied to medical imaging
 - Designed a complete brain tumor segmentation pipeline on MRI scans, from data preparation to evaluation of predicted masks.
 - Implemented a U-Net model with a ResNet-34 encoder, adapted to medical segmentation constraints where spatial precision is essential.
 - Set up a knowledge distillation approach to transfer knowledge from a teacher model to a lighter student model, with a focus on model compression and efficiency.
 - Evaluated the model on a test set with a Dice Score of 0.915, IoU of 0.887, and 98.2% validation accuracy.
 - **Stack:** Python, PyTorch, U-Net, ResNet-34, OpenCV, NumPy, medical image segmentation.
- **Chest X-ray Pathology Detection — EfficientNet, Uncertainty Handling** 2025 - 2026
Academic project — Deep Learning applied to medical imaging
 - Developed a multi-label chest X-ray classification pipeline on the CheXpert dataset, aiming to automatically detect several pulmonary and cardiac pathologies.
 - Trained an EfficientNet-B0/DenseNet-121 model while handling strong class imbalance and uncertain labels through loss weighting and U-Zero / U-Ignore strategies.
 - Evaluated the model with a mean AUC of 0.86, AUC of 0.91 for pleural effusion, 0.89 for cardiomegaly, and 0.88 for edema, complemented by F1-score, sensitivity, and specificity.
 - **Stack:** Python, PyTorch, TorchVision, EfficientNet, scikit-learn, OpenCV, medical image classification.

ADDITIONAL PROFILE

Languages: French (DALF C2), English (TOEIC C1)

Interests: Football, tennis, cinema, jogging

Collaborative experience: Multidisciplinary team projects, mentoring junior students