

Kerboua Abdennour

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Research Scientist Intern

Candidate

Engineering Student

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Perey, Palaiseau

Possible start: April 2026

(01/04/2026)

EDUCATION

- **École Normale Supérieure Paris-Saclay, Master Mathématiques, Vision, Apprentissage (MVA)** 2025-2026
Leading Mathematics, Vision, Learning algorithm Master
- **Télécom Paris, Institut Polytechnique de Paris (IPP), Engineering Degree** 2023-2026
Leading Digital Engineering and Computer Science School
 - ↔ **Specializations** : Image Processing, Signal Processing, Artificial Intelligence
 - ↔ **GPA** : 1st year of Engineering Studies : 4/4, 2nd year of Engineering Studies : 4/4
- **Janson-De-Sailly, Preparatory Classes, MPSI-MP*** 2020-2023
Intensive preparatory classes in mathematics, physics and chemistry for admission to the Grandes Écoles. High Honors
- **School Group Saint Jean Baptiste de La Salle (Middle/High School)** 2020
Scientific Baccalaureate with Mathematics, Physics and Natural Science Specializations High Honors

PROJECTS & CHALLENGES

- **NCSN and Diffusion Models for Medical Imaging** 2025
Github Project Page : [AbdennourKerPro/DDPM-NCSN](#)
 - Implemented both NCSN and Diffusion models
 - Assessed the generation and inpainting capabilities of both technics on MedMNIST benchmark
 - Assessed the generalization capability of Denoising Diffusion Probabilistic Models
- **ALTeGraD Challenge: Molecular Graph Captioning** 2025
Github Project Page : [AbdennourKerPro/altegrad](#)
 - Developed a multi-modal Deep Learning framework for Molecular Graph Captioning to bridge geometric deep learning and NLP
 - Implemented a dual-encoder architecture (GCN + SciBERT) trained with contrastive loss to align molecular graph embeddings with textual descriptions
- **Self-supervised Learning for Medical Imaging** 2025
Github Project Page : [AbdennourKerPro/SelfSupervisedLearningProject](#)
 - Implemented both SimCLR and Barlow Twins method
 - Assessed the efficiency of the self supervised learning on Medical Imaging provided in MedMNIST benchmark dataset
- **Challenge AI : IBM x Telecom Business and Finance (TBF)** 2025
Github Project Page : [AbdennourKerPro/challenge-IBM](#)
 - Took part in an AI challenge organized by IBM to classify fraudulent transactions, handled pre-processing and cleaning on a 300,000-entry DataFrame, engineering features, and training a Random Forest with special attention to class imbalance and finished 3rd out of 25 teams with a 69 % F1 score.
- **Sign Language Recognition** 2025
Github Project Page : [AbdennourKerPro/SignLanguageRecognition](#)
 - Implemented a sign language recognition prototype using mediapipe library and training a Random forest model
- **Exemplar-Based Patch Inpainting Method Implementation** 2025
Github Project Page : [AbdennourKerPro/Exemplar-Based-Inpainting](#)
 - Implemented the method described in the following publication : "*Object Removal by Exemplar-Based Inpainting*" written by A. Criminisi, P. Pérez and K. Toyama.
- **Programming and building a Smart Remote Car with Automatic QR Code Navigation** 2024
Github Project Page : [AbdennourKerPro/Smart-Remote-Car-with-Automatic-QR-Code-Navigation](#)
 - Assembled the robot car (motors, Raspberry Pi), connected and configured the motor drivers via GPIO, enabling the Raspberry Pi to control motor functions through parameterized PWM signals.
 - Designed python code to remote-control the car
 - Designed python code adding an automatic route feature with beacon detection

COURSES COMPLETED

2025/26

- **Probabilistic Graphical Model and Deep Generative Model:** Diffusion models, VAEs, HVAEs, Score Matching
- **Robotics**
- **Convex Optimization**
- **Machine Learning for Time Series**
- **Advanced learning for text and graph data:** LLMs, RLHF, DPO, GRPO, RAGs, Distillation, Graph Mining, Deep Learning for Graph, Multimodality
- **Deep Learning:** Computer Vision (ViT, YOLO...), Generative Models (GAN, WGAN, ...) Self-Supervised Learning (SimCLR, Barlow Twins, CLIP, ...)

2024/25

- **Artificial Intelligence :** Machine Learning (Supervised/Unsupervised Learning : SVMs, Random Forests, Clustering, LDA/QDA/Naive Bayes, KNN), Neural Networks/Deep Learning (MLP, CNN, RNN, Attention-based, Transformers), Text Mining, Generative models (GAN, WGAN, Diffusion models...), NLP, ...
- **Mathematics for Artificial Intelligence :** Signal representation, Time series, Convex/Non-Convex Optimization, Statistics, Linear regression, Speech and music analysis, Numerical analysis, Databases
- **Image analysis and processing** (*Segmentation, Restoration, denoising, Image Registration...*) : Medical and Biological Imaging, Variational and Bayesian Method, Discrete Optimization, Patch-Based Methods, Computational Photography, 3D Vision and Video (Motion estimation, Object Tracking, Homography estimation & Camera Calibration, Range scans to meshes), Knowledge Representation, Machine Learning for Image Processing and Object Recognition, Coherent Imaging, Source Separation, Remote Sensing, Industrial Applications
- **Social and environmental impact :** Foundations of the Environmental Impact of Digital Technology, Corporate Finance, Quantitative analysis of User Experience, Intellectual property for digital engineers

EXPERIENCE

- **Frequency Control Technician for the French National Frequency Agency** *August and September 2024*
Fixed-Term Contract with ANFR Paris and Surrounding Areas
 - Frequency spectrum control for the **Olympic and Paralympic Games** and major events
 - Testing and labeling of radio frequency equipment as part of the **Olympic and Paralympic Games**
- **Sales Associate and Runner at Olympic Games Official Store** *July and August 2024*
Fixed-Term Contract with Fan Avenue, Legends Paris
 - Customer service, advising, and selling merchandise at the official store of the **Olympic and Paralympic Games**
 - Responsible for restocking and inventory management in the store
- **Private Tutoring** *2020-Present*
Freelance Paris and Surrounding Areas
 - Private tutoring in Mathematics and Physics for middle, high school and undergraduate students

SKILLS

- **Languages :** French (Native), English (Fluent **C1/2**), Spanish (Basic communication skills **B1/2**)
- **Programming Languages :** Python (PyTorch/Jax/Tensorflow), C, Java, OCaml , HTML, CSS, JavaScript
- **Familiar Operating Systems :** Windows, MacOS, Linux (Debian, Ubuntu...)
- **Softwares :** Visual Studio Code, Anaconda,...

INTERESTS

- **Programming,** Web and Applications *HTML, CSS, Swift*
- **Reading and Writing,** Science Fiction, Politics, Philosophy, Social and Economic Sciences

VOLUNTEERING

- **Treasurer in association** *2018-2020*
Humanitarian association Humanit'aide
 - Project and financial management
 - Fundraising for humanitarian projects