

SKILLS

- **Programming Languages:** Python, Java, C++, SQL, JavaScript, PHP, HTML, CSS
- **Technologies & Tools:** ROS2, Deep Learning, Computer Vision, CNN, LLM, Transformers, Git, Linux
- **Frameworks & Libraries:** PyTorch, TensorFlow, OpenCV, Huggingface, Pandas, NumPy, Matplotlib, NLTK
- **Languages:** English (Intermediate), Italian (Native)

EXPERIENCE

- **TXT E-Tech** Milan, Italy
R&D AI Engineer - Aerospace & Defence [Article] Jun 2024 — Present
 - **Data Processing & Infrastructure:** Analyzed large datasets (terabytes), cleaning and structuring data for model training. Designed ROS2 communication frameworks (subscribers, publishers, client-server services) in C++ and Python for data exchange between robotics, controller, and computer vision modules.
 - **Object Detection & Model Fine-Tuning:** Fine-tuned DETR in PyTorch for tasks like solar cell detection and cockpit component validation, developing training pipelines with CUDA acceleration and incorporating data augmentation, loss optimization and hyperparameter tuning.
 - **Audio Matching:** Created an audio matching system in Python to verify cockpit audio playback, applying feature extraction techniques (MFCC, CHROMA) and using DTW/cosine similarity for matching. Managed microphone streams on Linux systems.
 - **Dataset Creation:** Coordinated the creation of an aerial dataset for a Kaggle competition, processing frames from video, applying post-processing (cropping, blurring), and annotating data using CVAT.
- **Polytechnic University of Milan** Milan, Italy
Student Researcher - Perivallon European Project [GitHub] Feb 2023 — Apr 2024
 - **Model Development:** Developed CNN and ViT based models for illegal waste classification in satellite images using Python and Keras, achieving an F1-Score of 90%.
 - **Training and Evaluation Pipeline:** Implemented training and evaluation pipeline, including data augmentation, loss function optimization, and hyperparameter tuning to enhance model performance.
 - **Weakly Supervised Segmentation:** Implemented weakly supervised segmentation using Hierarchical Heatmap Generation and MIL to localize illegal landfills. Leveraged pretrained models to extract heatmaps from satellite images, guiding the segmentation process and improving localization accuracy without pixel-level annotations.

PROJECTS

- **Contrastive Language-Image Pre-Training:** Explored CLIP models (Python, Keras) for image captioning, zero-shot classification and retrieval on COCO, ROCO (medical) and FashionProduct datasets. Evaluated encoder configurations (ViT, Bert, ResNet50). Developed a captioning decoder using CLIP embeddings. [GitHub]
- **Mathematical Models and Methods for Image Processing:** Implemented image processing algorithms in Python (numpy, matplotlib, scikit-learn) for tasks like denoising, inpainting and anomaly detection using methods such as OMP, FISTA, KSVD, NLMeans, BM3D and RANSAC. [GitHub]
- **Question Answering System:** Developed a QA system in Python, exploring extractive (DistilBERT, BERT, RoBERTa) and generative (GPT2, DistilGPT2) approaches. Fine-tuned on SQuAD for extractive QA (up to 79.73 EM, 82.94 F1) and generative QA (up to 60.00 EM, 61.54 F1). [GitHub]

EDUCATION

- **Polytechnic University of Milan** Milan, Italy
MSc in Computer Science; GPA: 3.74 (28.05/30) Sep 2020 – Apr 2024
 - **Thesis:** Perivallon - Detection of Illegal Landfills using Deep Learning: A Weakly Supervised Approach
 - **Relevant Courses:** Machine Learning, Artificial Neural Networks and Deep Learning, Recommender Systems, Robotics, Natural Language Processing, Mathematical models and methods for Image Processing, Transformers
- **University of Bari Aldo Moro** Bari, Italy
BSc in Computer Engineering; GPA: 3.79 (28.45/30) Sep 2014 – Oct 2018
 - **Thesis:** Solar radiation prediction through Machine Learning algorithms
 - **Relevant Courses:** Programming, Databases, Software Engineering, Software Systems Integration and Testing, Discrete Mathematics, Numerical Calculus, Statistics