Andrea Espis

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EDUCATION

University of Bologna — MSc in Artificial Intelligence

September 2019 - March 2022
Final grade: 110/110 cum laude (equivalent to 4.0 GPA).
Main interests: Computer Vision, Deep Learning, Neuroscience, NLP.

University of Cagliari— BSc in Biomedical Engineering

September 2016 - July 2019
Final grade: 110/110 cum laude (equivalent to 4.0 GPA).
Main interests: Physiology, Biology, Signal Processing, Machine Learning.

(SOME) PROJECTS

Equipment thermal anomaly detection -2022

Detection of anomalous equipment behavior thanks to RGB and thermal cameras, with no data about the standard working temperature of each piece of equipment (deployed in 50 sites).
Computer Vision, Deep Learning, Tensorflow, AWS SageMaker, AWS S3, AWS Ground Truth, Python.

Spare parts stock levels optimization- 2022

Forecasting of the number of parts of the equipment that are likely to break down within a certain period of time, in order to recommend the optimal levels of spare parts in store (deployed in 50 sites). $500k cost reduction wrt the purchase according to the parts vendor recommendations.
Machine Learning, Statistics, AutoGluon, SQL, Python.

Object Detection and Semantic Segmentation for Assisted Data Labeling- 2022

Design and development of a pipeline to achieve Assisted Data Labeling, a semi-automatic process to iteratively improve the quality of annotations. Thanks to it, 670 working hours were saved.
Computer Vision, Deep Learning, Google Colab, OpenCV, PyTorch, Python.

Question Answering- 2021

Training and deployment of the model BiDAF, and implementation of several variants to improve the results. The models have been deployed to address the QA problem: indicate the sentence containing the answer, within a text, with respect to a question.
NLP, Google Colab, PyTorch, Python.

Face Generation, ACGAN - 2020

Development of state-of-the-art models for conditional generation, such as Auxiliary Classifier GAN algorithm. The models are able to generate images representing faces. It is also possible to indicate 40 constraints like gender, age, skin tone, and hair color.
Deep Learning, Python, Tensorflow, Keras, Google Colab.

Neural Network implemented from scratch using only Numpy -2020

This is not a project to address a specific task, but the implementation of a Neural Network (NN) from scratch using just Numpy to play with the backpropagation algorithm and NN.
Deep Learning, PyTorch, Numpy.

Rectangle Packing - 2019

Solution to the rectangle packing problem with Constraint Programming (CP), and propositional SATisfiability (SAT) using the MiniZinc CP solver and the Z3 SAT/SMT solver.
CP, SAT, MiniZinc, SAT.

Unsupervised Spike Sorting -2019

'Spike' is the name given to the waveform observable from a signal recording the electrophysiological activity of neurons. In this project have been developed several algorithms based on Unsupervised Learning, such as Self-Organizing-Map and K-Means, for the automatic clustering of spikes from real signals recorded from neural cells. The goal is to determine which neuron the activity is coming from.
Matlab, Unsupervised Learning, Clustering, Physiology.

ECG Peak Detectors - 2019

Development of three peak detector algorithms for ECG signals. Useful to detect the heart rate. Each algorithm is based on signal amplitude, signal derivative, and biological properties.
Matlab, Signal Processing, Physiology.

WORK EXPERIENCE

The University of Bologna, Ph.D. candidate (Bologna)

March 2023-present
Developing frameworks beyond supervised learning for precision medicine. Supervised by Prof. Stefano Diciotti.
Deep Learning, Self-supervised learning, Semi-supervised learning, Multi-modal learning, Causal inference, Explainability, Precision Medicine, Imaging, Genomics, Neuroscience..

The University of Bologna, Research Fellow (Bologna)

December 2022-March 2023
Archiving of CT images and evaluation of diagnostic aid systems for lung cancer screening.
PACS, SQL, Statistics.

Amazon, Research Scientist Intern (Luxembourg)

April 2022-October 2022
Design and development of algorithms to answer business questions and support business decision-making, regarding all Amazon sites across Europe.
Machine Learning, Deep Learning, Computer Vision, Statistics, AWS, SQL.

DataVision, Machine Learning Engineer Intern (Prague)

October 2021 - March 2022
Development of algorithms in the field of Computer Vision for industrial applications.
Computer Vision, Machine Learning, Deep Learning.

Machine Learning Academic Tutor

December 2021 - February 2022
Supporting the students with the assignments of the Machine Learning course for the Business School, University of Bologna.
Machine Learning, Teaching.

EOLAB Internship

April 2019 - June 2019
Development of algorithms for biological signals denoising, at the Electrical Engineering Laboratory, University of Cagliari.
MATLAB, Discrete Wavelet Transform, Biology, Physiology.

Private tutor

June 2016 – Present
Private teaching about scientific subjects to students enrolled in middle school, high school, and University.
Mathematics, Computer Science, Physics.

HARD SKILLS

Python, SQL, MATLAB, C, Scala, Minizinc, Prolog.
Pandas, Sklearn, Keras, PyTorch, OpenCV.
Computer Vision, NLP.
Machine Learning, Deep Learning.
AWS SageMaker, AWS S3, AWS Ground Truth.
Calculus, Linear Algebra.
Neuroscience, Biology, Physiology.

SOFT SKILLS

Patience, honesty, ambition.
Fluid intelligence, quick learning.
Critical thinking, problem-solving.
Adaptability, collaboration.
Time management, attention to detail.

MSc's EXAM GRADES

Minimum grade during the MSc: 30/30.

Cognition and Neuroscience: 30 with honors.
Machine Learning: 30 with honors.
Deep Learning: 30 with honors.
Machine Learning for Computer Vision: 30 with honors.
Artificial Intelligence in Industry: 30 with honors.
Natural Language Processing: 30 with honors.
Languages and Algorithms for AI: 30 with honors.