

# Alberto Formaggio

MACHINE LEARNING ENGINEER · SOFTWARE ENGINEER

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## Work Experience

### ABB Research Center

Mannheim, Germany

RESEARCH INTERN & MASTER THESIS - COMPUTER VISION AND NATURAL LANGUAGE PROCESSING

Mar. 2024 - Oct. 2024

- Pre-processing of image data for object detection and text data for NER and relation extraction.
- Developed a fine-tuning training, evaluation and inference pipeline for object detection models like RetinaNet and Faster R-CNN for an industry-specific application.

### Startup Foundation

Rotterdam, Netherlands

SOFTWARE ENGINEER INTERN

Sep. 2018

- Built a rule-based sentiment analysis script in Python to categorize user interest in LinkedIn messages about company offers.
- Used API integration and OAuth2 for automating and improving aspects of employees' daily office tasks, boosting overall efficiency.

## Education

### University of Padova

Padua, Italy

MSc IN COMPUTER ENGINEERING (AI SPECIALIZATION)

Sep. 2022 - Dec. 2024

- Grade Point Weighted Average: 30/30 (**4.0 GPA**). **Top 1%** of my course of study
- Improved leadership and problem-solving skills by being a group leader in 4 university projects.
- **Main courses:** Machine Learning, Computer Vision, Operations Research, Intelligent Robotics, Learning from Graphs.

### Charles University

Prague, Czech Republic

ERASMUS+ EXCHANGE SEMESTER - COMPUTER SCIENCE AND AI

Feb. 2023 - Jul. 2023

- **Main courses:** Deep Learning, Natural Language Processing, Speech Recognition, Data Mining, Multiagent Systems.

### University of Padova

Padua, Italy

BSc IN COMPUTER ENGINEERING | FINAL GRADE: 110/110 CUM LAUDE

Sep. 2019 - Jul. 2022

- **Top 1%** of my course of study. **4.0 GPA**
- **Main courses:** Artificial Intelligence, Android Development, Software Engineering, Database Design, Operative Systems, Calculus, Physics.

## Projects

### An Empirical Study on Ensemble of Segmentation Approaches

Paper published on Signals

MATLAB FOR DEEP LEARNING

Jun. 2022

- Conducted empirical research for image segmentation, achieving an average Dice score of 89.3% over five datasets, surpassing previous methods. The research leveraged the diversity of ensembles using different architectures, loss functions and data augmentation techniques.
- Implemented new loss functions, inspired by recent papers. [Code, Paper]

### Climate Change Sentiment Analysis: Analyzing Public Perception through Twitter Data

TENSORFLOW, PANDAS, SCIPY, SCIKIT-LEARN, NUMPY, PYTHON

- Explored Sentiment Analysis over Twitter data regarding Climate Change with preprocessing, class imbalance handling, various Machine Learning classification techniques (e.g. Naive Bayes Classifier, SVM, Logistic Regression), and applied BERT for performance improvement.
- Notably achieved an **86% F1-Score** in sentiment analysis by leveraging the Large Language Model BeRT. [Code, Blog Article]

### Multi-dataset weather classification

PYTORCH, NUMPY, PYTHON

- Image classification on weather images from multiple datasets using joint training for classes having similar features across different datasets.
- Handled dataset and class imbalance. [Code, Report]

### Better Quality Embeddings for Node Classification Combining Classification with Link Prediction in Graph Neural Networks

PYTORCH, PYTORCHGEOMETRIC, PYTHON

- Implementation of Link Prediction as self-supervised pre-training technique in Graph Neural Networks for node classification.
- Evaluated the approach across GCN, GAT and GraphSAGE, augmented with MLP. [Code, Report]

## Honors & Awards

2023 **Top 3 startup idea**, Huawei Seeds for the Future - Tech4Good

IT - NO - DRC - NL Cohort

Our startup idea of developing an app relying on AI and 5G for natural disaster recovery was among the top 3 ideas in our cohort (out of 10 teams).

2021, 2022 **4 x Merit scholarship winner**, University of Padova

Padua, Italy

1000€ scholarships given based on merit among all students attending the University of Padova