

# Tommaso Derossi

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## Experience

### Supervised Program for Alignment Research

September 2025 - Present

Remote

Research Fellow

<https://sparai.org/>

- Working on a **CoT monitoring** project supervised by Rauno Arike.
- Researching **CoT decompositions techniques and attribution methods** to efficiently analyze LLMs reasoning traces and study **unsafe models' behaviours** with a focus on **CoT unfaithfulness**.

### GEA Procomac SPA

November 2024 - Present

Industrial PhD

<https://www.gea.com/en/>

- Currently working on a patented project in the design and development of a **recommendation system** for **troubleshooting industrial plant machinery**.

Some of the **main technologies** involved are: Embedding models, Vector Databases, Clustering Algorithms, Local Language models.

### Freelance

September 2024 - Present

- Currently collaborating with a start-up on a project whose aim is to facilitate the **mutual search** for **job seekers** and **companies** looking for employees, my **focus** is on the technical development of the **recommendation engine**.

### Tomorrow S.R.L.

February 2023 - July 2024

Data Scientist

<https://www.tomorrowsrl.com/>

- Conceptualized and developed data transformation pipelines integrated with **machine learning** models (Bayesian hierarchical models, Random forest, Gradient boosting) for the analysis and presentation of **IOT data** (Predictive maintenance, KPIs optimization, Data-driven actionable insights, Time series forecasting)
- Designed and implemented customized **AI conversational agent** for purchasing assistance based on **LLMs** (LLMs prompting and finetuning, RAG, LLamaIndex, Langhchain)
- Built a **recommendation system** and visualization dashboard for data-driven soccer scouting decision-making support, based on massive **match-events data** and **machine learning** models (Pytorch, Sklearn)
- Created **marketing automation pipelines** from **target audience selection** and **content production** to **campaign creation and management** with **human-in-the-loop** for different advertisement platforms (Linkedin, Meta, X)

### WATERONMARS S.R.L.

March 2022 - February 2023

Data Scientist

<https://www.waternmars.it/>

- Built **ETL pipelines** (Visokio Omniscope) for the download (Web-scraping, API) and analysis of web content, in particular, **social media data** (textual data, images, videos, geospatial and temporal data)
- Implemented and integrated **predictive models** for data enrichment in the domains of **computer vision** (OpenCV, SimpleCV) and **natural language processing** (Spacy, Transformers, NLTK, Gensim, TextBlob, Prodigy)
- Created highly customized **data visualization dashboards** for various clients and types of analysis (Geospatial analytics - GIS, Election campaign analysis, Brand monitoring, Buyer persona, USP analysis, E-commerce analytics)

### OMIGRADE S.R.L.

March 2019 - October 2020

Machine Learning engineer

<https://www.omigrade.it/>

- Designed, prototyped, and optimized a model based on **deep recurrent neural networks** (LSTM, Tensorflow) for the **interactive classification of relational databases' columns**
- Engineered and integrated in a **distributed environment** (Hadoop cluster) the machine learning-based model prototyped (**MLOps**: standardized data preparation, Distributed data with spark's RDD, automated periodic distributed re-training, monitoring, and performance analysis) + Exploration of model variations and data post-processing techniques

**Performance:** 60 classes, Top-1 accuracy:  $89.0 \pm 1.5\%$ , Top-5 accuracy:  $94.1 \pm 0.3\%$

## Education

### Università degli studi di Parma

November 2024 - Present

PhD Student

Deep Learning

- Currently doing research on Artificial Neural Networks **safety and interpretability** with a focus on **Large Language Models** working on combinations of **bottom-up (mechanistic interpretability)** and **top-down (behavioral experiments)** approaches.

### Università degli studi di Torino

September 2019 - April 2023

Master Degree

Stochastics and Data Science

<https://www.unito.it/>

- Degree course in **Mathematics** fully taught in **English**

**Thesis:** "Modelling the discourse around nature in Twitter in presence of highly imbalanced data."

**Thesis topics:** Natural Language Processing, Transformers models, Network Science, Filtering Techniques, Sentiment Classification, Semantic Clustering, Topic Modeling

### KU Leuven

September 2020 - July 2021

1 year exchange programme

Statistics

<https://www.kuleuven.be/>

- Second year of master's degree spent in Belgium at KU Leuven. Some of the main courses attended (10 courses in total): **Optimization and Numerical Methods** (17/20), **Concepts of Bayesian Data Analysis** (16/20), **Data Mining and Neural Networks** (15/20), and **Modern Data Analytics** (15/20)
- Participated in **Data4Good Challenge (Emergent Leuven)**

### Università degli studi di Parma

September 2016 - September 2019

Bachelor Degree

Physics

<https://www.unipr.it/>

- Awarded for being the **top-ranked student in credits earned relative to grade point average** during the second academic year

**Thesis:** "Methodological aspects of neural networks integrated within an application for the classification of relational database columns."

**Thesis topics:** Artificial Neural Networks, Deep Recurrent Neural Networks (LSTM), Distributed Model Training

### Liceo Scientifico "Giacomo Ulivi"

2011 - 2016

Scientific Oriented

High School

### South African College High School

2012

English School Attendance, 3 months

## Skills

### Python

R

MATLAB

SQL, NoSQL

MS Office (Excel), LaTeX

ML/DL (Pytorch, Tensorflow)

Spark, MLflow

Visokio Omniscope

## Languages

### Italian

Mother tongue

English

Fluent

Spanish

Intermediate