Ernesto Bocini

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Education

École Polytechnique Fédérale de Lausanne (EPFL) — *Lausanne, Switzerland*

MSc in Data Science — *Sept 2022 - Jul 2025*

- **Relevant courses**: Machine Learning, Network ML, Functional Programming, Distributed Information Systems, Graph Theory, Large-scale data science. Doctoral courses: Deep Learning for NLP, Graph representations.
- **Teaching Assistant**: Deep Learning For Autonomous Vehicles, Intrnet Analytics, Introduction to Machine learning, Probability and Statistics.

University Of Bologna - Alma Mater Studiorum — *Bologna, Italy*

BSc in Mathematics and Statistics - Curriculum STATS&MATHS — *Sept 2019 - Jul 2022*

- **Graduated with Distinction**: 110/110 cum Laude, GPA = 29.6/30, top 5%.
- **Award-winning Thesis**: *'Outlier Detection for Multivariate Time Series: A study of Brain Scans in Neuroscience.'*
- **Exchange Semester** in Statistics at **Lund University** (Sweden). Relevant courses: Bayesian Modeling, Stochastic Simulation.

Work Experience

Research Student — *EPFL*

NLP Lab (Prof. Bosselut) — *Jan 2024 - July 2024*

- Improving understanding abilities and alignment of **Vision-Language Models** by developing the necessary learning objectives that (a) are suitable for the individual modalities and (b) require information to flow across modalities.

Research Student — *EPFL & Campus Biotech*

NeuroAI LAB (Prof. Schrimpf) — *Jul 2023 - Feb 2024*

- Project supervised by Professor Martin Schrimpf and in collaboration with Mike Ferguson at MIT. Improving **Computer Vision** models' performance on Out Of Domain tasks by aligning Models to Primate Visual Stream's late representations. Making models more 'brain-like' successfully showed improved generalization performances.

Data Science Consultant — *Hybrid - Prato*

Magniflex — *Jan 2023 - May 2023*

- Supervised a team of Senior Software Engineers in implementing new Machine Learning solutions for the company.

Selected Projects

Freshness in an Outdated Model using a Knowledge Graph with BERT Pruner — *Lausanne, Switzerland*

EPFL — *Sept 2023 - Jan 2024*

- Investigated the challenge of maintaining factual accuracy in LLMs post-training, proposing Knowledge Graphs (KGs) as a solution.
- Developed a framework involving BERT-based subgraph retrieval and prompt-augmentation.

A Comparison of Human and LLMs Wikispeedia Strategy — *Lausanne, Switzerland*

EPFL — *Sept 2023 - Jan 2024*

- Evaluated Mistral 7B's navigation decisions in *Wikispeedia Game* against human choices to investigate differences in the extracted semantic paths. Used hugging-face libraries and LMQL to instruct the model to follow restrictive instructions.
- Selected as one of the **top 10** projects among 122 submissions **(top 8%)**, receiving the best project award.

Drosophila Brain Wiring Diagram with GAT — *Lausanne, Switzerland*

EPFL — *Feb 2023 - Jun 2023*

- Employed the Fast-Parapred Model, a variant of Graph Attention Networks (GATs), to accurately predict neuron types and hemilineages.
- Final grade 5.75/6, ranking in the **top 1%** of the class, allowing me to participate to the Doctoral Level Course: *Graph representations for biology and medicine*. Reference Letter from the professor at this link.

Achievements

Best Undergraduate Thesis in Computer Science from Europe (2022) — *The Global Undergraduate Awards*

- First Place in Europe, Top 10% Global in the Computer Science Category. Published the project in *Global Undergraduate Library*. Certificate downloadable at this link.

Top 10 Graduate Award in Statistical Sciences 2021/2022 — *University of Bologna*

- Recognized as one of the top 10 graduates in Statistical Sciences, honoring exceptional dedication to academics and community service. Certificate downloadable at this link.

Lead The Future - Mentee — *Lead The Future Mentorship*

- Acceptance rate below 15%. Mentor: Matteo Pelosi - Research Scientist II AWS (Chicago).

Skills

Programming Python, Scala, SQL | Spark, Hadoop | Git, LaTeX | HuggingFace, LMQL

Languages Italian (Native), English (TOEFL 107/120, C1), French (B1)