Ernesto Bocini

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Experience

Logitech, Machine Learning Research Engineer - Cognitive Science Team — Lausanne, CH — Aug 2024 – Feb 2025

- Implementation and research of self-supervised ML, and signal processing techniques to improve mental workload classification through noisy EEG recordings.
- Integrated from scratch an end-to-end pipeline for neuro and biosignals preprocessing to speed up Logitech's future projects.
- Implemented a fine-tuned version of Brain-Bert, which reached SOTA performances.

NeuroAI Lab – EPFL, Research Assistant — Lausanne, CH — Jul 2023 – Ongoing

- Supervised by Prof. Martin Schrimpf. Project in collaboration with DiCarlo Lab **@MIT** .
- Created a multi-loss training framework for making Computer Vision models more *'brain-like'*, and make them better at out-of-domain generalization.
- **Published at CCN 2024** the abstract: 'Inferotemporal Cortex Underlies Primate Generalization Capabilities and Brain-Aligned Models Generalize Better'. I am currently expanding this work for a journal publication (Nature Neuroscience).
- Actively contributed to Brain-Score platform, by submitting new IT and Behavioral benchmarks.
- Designed and collected a behavioral experiment that involved over 150 participants, aimed at comparing the performance in image recognition across various domains between humans and models.

NLP LAB – EPFL, Research Student — Lausanne, CH — Jan 2024 – Jul 2024

- Supervised by Prof. Antoine Bosselut.
- Conducted advanced research on enhancing Image-Text (IT) alignment in Vision-Language Models (VLMs).
- Fine-tuned LLaVA models to improve image captioning accuracy, leveraging the COCO Caption Benchmark for evaluation.
- Developed innovative methods for classifying image-text relationships, enhancing alignment techniques using both human-annotated and automated datasets. Applied these findings for improving dataset curation and filtering.

Magniflex, Data Scientist — Prato, IT — Jan 2023 – May 2023

- Designed from scratch a Sleep Classification method for the company integrating multi-sensory information into LSTM model.
- The model is now used in the company's UI for their new smart mattresses.

Hennig's Lab – UniBO, Research Thesis Student — Bolgona, IT — Apr 2022 – Jul 2022

- Awarded **"Best Undergraduate Thesis in Europe (Computer Science)"** at the GUA Dublin 2022, for pioneering research on multivariate time series analysis of brain scans.
- Developed a novel outlier detection procedure for multivariate time series. Applied advanced statistical models such as VARIMA and dimensionality reduction, enabling the study of neural patterns during resting states in subjects with various neuropsychiatric conditions.
- Published in the Global Undergraduate Library, contributing to advancements in neuroscience through a rigorous, data-driven approach to detecting and interpreting outliers in complex brain activity data.
- Made it to the UniBO Magazine, with a dedicated article.

Education

MSc **École Polytechnique Fédérale de Lausanne (EPFL)**, Data Science — Sept 2022 – Aug 2025

- **Research Projects at:** NeuroAI Lab, NLP Lab , Idiap Research Institute, SMS Lab (@ETH)
- **Relevant courses**: Modern NLP, Machine Learning, Network ML, Brain Like Computations, Deep Learning for NLP (Doctoral course)
- **Teaching Assistant**: Deep Learning For Autonomous Vehicles, Internet Analytics, Introduction to ML, Probability and Statistics
- **Coursework:** Computer Architecture, Comparison of Learning Algorithms, Computational Theory

BSc **University of Bologna**, Mathematics and Statistics — Sept 2019 – May 2022

- 110/110 cum Laude, GPA: 29.57/30 (top 5%)
- **Thesis:** *'Outlier Detection in Multivariate Time Series: A study of Brain Scans in Neuroscience'*. **Best thesis in Europe** in the computer science category at the GUA Dublin 2022.

EXC **University Of Lund**, Exchange semester in Statistics — Sept 2021 – May 2022

- **Relevant courses**: Bayesian Modeling, Signal Processing and Stochastic Simulation, Data Visualization.

Achievements

Lead The Future - Mentee Among the few Italian students selected to be mentees for LeadTheFuture, a leading mentorship non-profit organization for students in STEM, with acceptance rate below 15%. Mentored by: Matteo Pelosi (Research Scientist II AWS Chicago). — Sept 2023

Top 10 Graduate Award in Statistical Sciences 2021/2022 Recognized as one of the top 10 graduates in Statistical Sciences, honoring exceptional dedication to academics and community service. Overview of the award on my personal page. The certificate is downloadable at this link. — Sept 2022

Languages

Italian – Native
English – Advanced (C1 – TOEFL Score 104/120)
French – Beginner/Intermediate (∼ B1)

Skills

Programming – Python, R, SQL, Scala, Bash, IDEs
Data Science – Spark, Hadoop, Docker, AWS, Git, DOEs
ML & DL – NumPy, Pandas, sklearn, PyTorch, TensorFlow, Cloud computing

Recommendation Letters & Contact of Reference

Prof. Martin Schrimpf martin.schrimpf@epfl.ch - Available on request

Prof. Antoine Bosselut antoine.bosselut@epfl.ch - Available on request

Dr. Dorina Thanou dorina.thanou@epfl.ch - link to general letter

Prof. Robert West robert.west@epfl.ch - link to general letter

Prof. Karl Aberer karl.aberer@epfl.ch - link to general letter