

PUBLICATIONS & PROJECTS

- **ICL Improves Compositional Understanding of VLMs:** *Research published ICML Workshop, 2024.*
Analysed and evaluated generative and contrastive-based VLMs such as CLIP, LLaVa and cogVLM on compositionality-based benchmarks (ARO, winoground, sugarcrape). We find that using task-specific ICL few-shot examples significantly improves the compositional understanding capabilities of VLMs, attaining a 5% enhancement.
- **'Explaining RL decisions with trajectories': A Reproducibility Study:** *Research published TMLR, 2024.*
Reproduced and extended 'Explaining RL decisions with trajectories' from Adobe Research. Investigated new methodologies by changing the clustering algorithm and by encoding trajectories through Hugging Face based Transformers. Obtained better visual cluster representation.
- **Vocabulary Reduction and Contrastive Decoding in LLMs:** *Research to be submitted, 2024.*
Modified existing early-exiting techniques and applied contrastive decoding to encoder-decoder Large Language models such t5. By employing vocabulary pruning technique we achieved 100x improvement in FLOPs, while retaining almost all performance.
- **AI-Lab Competition Winner:** *University project* employing Unsupervised and Supervised ML methods to analyse breast cancer cells and capture interactions between them. Detected with a success rate of 95% Hypoxic vs Normoxic cells. Received founding to present the work at the University of Oxford Oncology Department.
- **Deep Generative models and Transformer based models:** *University project* implementing causal self-attention in gpt-2 and developed Variational Auto-encoders and Adversarial Auto-encoders from scratch in PyTorch.

EDUCATION

- **University of Amsterdam** Amsterdam, The Netherlands
MSc in Artificial Intelligence; GPA: 4.0/4.0 (8.3/10) *Sep 2023 - Current*
 - **Relevant Courses:** Foundation Models, Deep Learning 1 & 2, Computer Vision, Natural Language Processing, Information Retrieval, Machine Learning 1
- **Università Commerciale Luigi Bocconi** Milan, Italy
BSc in Mathematics and Computing Sciences for Artificial Intelligence; GPA: 3.6/4.0 (99/110) *Sep 2020 - Jul 2023*
 - **Thesis:** Analysed **Generative** Adversarial Networks and Recurrent Neural Networks with time-series financial data to determine future prices of stocks.
 - **Relevant Courses:** Machine Learning, Mathematical Modelling for Finance, Mathematical Analysis 1,2 & 3, Physics 1 & 2, Statistical and Quantum Physics, Optimization Algorithms, Programming
- **University of Sydney** Sydney, Australia
Exchange Semester in Applied Mathematics and Computing Sciences; GPA: 3.6/4.0 *Feb 2023 - Jul 2023*
 - **Scholarship:** Selected by merit and received a full ride scholarship of 26,500 A\$.
 - **Relevant Courses:** Stochastic Processes (Adv), Big Data and Data Diversity (Adv), Deep Learning

EXPERIENCE

- **eBay** Amsterdam, The Netherlands
Applied Scientist *Jul 2024 - Current*
 - **MLLMs:** Intern on Multimodal LLMs research and development for data, architecture and pre-training.
- **Aindo** Milan, Italy
Machine Learning Engineer *Jun 2022 - Sep 2022*
 - **VAEs:** Learned PyTorch library and **developed Variational Auto-encoders from scratch.**
- **BAINSA** Milan, Italy
Co-Founder *Jan 2022 - Jul 2023*
 - **AI association:** Founded first Artificial Intelligence association at Bocconi University.

PROGRAMMING SKILLS

- **Languages:** Python, R, SQL, LaTeX, C (Beginner)
- **Libraries:** Pytorch, OpenCV, SciPy, Pandas, NumPy, Matplotlib, Scikit Learn, CLIP, Transformers