

Samuele Punzo

AI Master's student, University of Amsterdam
Mechanistic Interpretability & Explainable AI

✉ samuelepunzo@gmail.com

🐙 github.com/Samuele-123

🌐 linkedin.com/in/samuele-punzo

RESEARCH INTERESTS

mechanistic interpretability, explainability, natural language processing, large language models, biomedical applications

RESEARCH EXPERIENCE

Institute for Logic, Language and Computation (ILLC) — UvA

Jan. 2026 – present

Research Assistant

Amsterdam, NL

- Extending a token-level perplexity framework by identifying the internal neural circuits responsible for linguistic disambiguation.

BioMedical and Health Informatics Lab — University of Pisa

Nov. 2024 – Nov. 2025

Research Assistant

Pisa, IT

- **PANS project:**

- * Developed machine learning models to identify blood-brain barrier permeable proteins and metabolites linked to Pediatric Acute-onset Neuropsychiatric Syndrome (PANS).

- **MEDICA project:**

- * Built a bioinformatics pipeline to compare and evaluate different Microarray integration methods (ComBat, XPN), improving data consistency.
- * Developed explainable machine learning pipelines for Microarray and scRNA-seq data to identify novel Multiple Sclerosis biomarkers and pathways, using biological enrichment analysis tools such as DAVID, StringDB, and Cytoscape.

EDUCATION

University of Amsterdam

Sep. 2025 – Jul. 2027 (expected)

M.S. in Artificial Intelligence | [Link to all courses](#)

GPA: 8.6/10 (**Excellent**, A+ in US/UK scale)

- Relevant Courses: Machine Learning, Deep Learning, Reinforcement Learning, NLP, Fairness & Accountability for AI, Information Retrieval, Foundation Models

University of Pisa

Sep. 2021 – Oct. 2024

B.S. in Computer Science | [Link to all courses](#)

Grade: 110/110 with honours | GPA: 29/30

Bachelor Thesis: *Research of new biomarkers for Multiple Sclerosis using Machine Learning techniques*

- Relevant Courses: Machine Learning, Statistics, Numerical Calculus (MatLab), OOP (Java), Web Scraping and Data Analysis (Python), Algorithms and Data Structures (C)

PUBLICATIONS

Machine Learning for analysis of Multiple Sclerosis cross-tissue bulk and single-cell transcriptomics data *Under review*

F. Massafra*, S. **Punzo***, S.G. Galfrè, A. Maglione, *arXiv:2603.05572*
C. Priami, A. Sîrbu (*equal contribution)

– Integrative Multi-Omics and Explainable Machine Learning analysis for pathway-level signatures discovery in Multiple Sclerosis. Under review: *Scientific Reports*.

ML Pipeline for Multiple Sclerosis Biomarker Discovery: *2025*
XAI vs. Statistical Approaches

S. **Punzo**, S.G. Galfrè, F. Massafra, A. Maglione, C. Priami, A. Sîrbu *arXiv:2509.22484*

– A Machine Learning Pipeline for Multiple Sclerosis biomarker discovery: Comparing explainable AI and traditional statistical approaches. Presented at BBCC24, CIBB25.

TEACHING EXPERIENCE

Vrije Universiteit Amsterdam *Starting Feb. 2026*

Teaching Assistant — BSc Machine Learning course *Amsterdam, NL*

– Delivered two exercise lectures and one project session per week, guiding 10 groups of students through the development of their machine learning projects.

EXTRACURRICULAR ACTIVITIES

Genetics and Molecular Biology *Sep. 2024 – Dec. 2024*

Extra courses offered by the MSc in Biotechnology and Applied AI for Health, University of Pisa.

Bologna Orthogonal Summer Term '24 *Aug. 2024*

Selected among the best Italian STEM students for a fully funded 2-week CS summer school by Fondazione ELICSIR; courses on ML theory and biomedical applications.

Futuro Annunciato '24 *Jul. 2024*

Selected for a fully funded 3-day CS summer school on frontiers of CS, organised by Fondazione ELICSIR and sponsored by Schmidt Sciences.

HONOURS AND AWARDS

Lead The Future

Selected as a mentee (acceptance rate <15%) for this leading STEM mentorship non-profit organisation.

Graduation with Honours

Bachelor of Computer Science, University of Pisa (110/110 *cum laude*).

Top 5% of Students

Among the 5% best students in all three academic years of the BSc at University of Pisa.

TECHNICAL SKILLS

Programming Languages: Python, R, C, Bash

ML / DL & Data Science: Machine Learning, Deep Learning, Explainable AI, Genomic data analysis (Microarray, scRNA-seq), Statistical methods

DL Frameworks & Interpretability: PyTorch, HuggingFace Transformers, TransformerLens, scikit-learn, SHAP, LIME

Developer Tools: Git, GitHub, Linux, Docker

LANGUAGES

Italian: Native

English: C1 Cambridge Certificate, issued April 2024 (ID: C5872768)

German: A2