

Francesco Maria Molfese

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Experience

Amazon AGI, Applied Scientist Intern

May 2025 – Oct. 2025. *Barcelona, Spain*

- Trained Long-Context Language Models (LCLMs) using Reinforcement Learning with GRPO to augment in-context retrieval capabilities; improved performance by up to 20.1% on the in-domain long-context benchmark HELMET, and up to 8.9% on out-of-domain benchmarks (InfiniteBench, LongBench-v2, Loong).
- Tested LCLMs performance under efficient KV-cache compression strategies and analyzed attention allocation towards relevant documents in question answering tasks.

Babelscape, NLP Engineer

June 2022 – July 2023. *Rome, Italy*

- Developed state-of-the-art cross-lingual sentence alignment systems for long texts.
- Engineered a highly efficient and accurate entity disambiguation system.
- Evaluated multilingual sentence embeddings for cross-lingual transfer.

Target Reply, Data Scientist

Nov. 2021 – May 2022. *Rome, Italy*

- Developed computer vision segmentation pipelines for satellite imagery and unsupervised clustering for resource allocation, integrating microservices with AWS big-data pipelines.

Education

Ph.D. in Artificial Intelligence, Sapienza University of Rome

Nov. 2022 – Nov. 2025. *Rome, Italy*

- Focus: LLMs, Question Answering, Retrieval Augmented Generation, Evaluation, Reasoning, Long-Context Language Models.
- Advisor: Prof. Roberto Navigli.

M.Sc. in Engineering in Computer Science, Sapienza University of Rome

Oct. 2019 – Oct. 2021. *Rome, Italy*

- Grade: 110/110 cum laude (GPA: 29.7/30). Thesis carried out in collaboration with Florida Atlantic University.
- Advisors: Prof. F. Cuomo, Prof. D. Pados.

B.Sc. in Engineering in Computer Science, Sapienza University of Rome

Sept. 2016 – Oct. 2019. *Rome, Italy*

Technical Skills

Languages & Core: Python, SQL, Bash, Git, Docker, Unix/Linux, CI/CD, Kubernetes.

AI/ML Stack: PyTorch, Hugging Face (Transformers, Datasets, Accelerate), vLLM, SGLang, vERL, WandB.

Expertise: LLM Pre-training/Fine-tuning, RAG, Long-Context LLMs, Reasoning, Information Retrieval, Question Answering.

Selected Publications

ReTraceQA: Evaluating Reasoning Traces of Small Language Models in Commonsense Question Answering.

Francesco Maria Molfese, Luca Moroni, Ciro Porcaro, Simone Conia, and Roberto Navigli. 2025. *ArXiv preprint*, currently under review.

Right Answer, Wrong Score: Uncovering the Inconsistencies of LLM Evaluation in Multiple-Choice Question Answering.

Francesco Maria Molfese, Luca Moroni, Luca Gioffré, Alessandro Scirè, Simone Conia, and Roberto Navigli. In Findings of the Association for Computational Linguistics: ACL 2025, Vienna, Austria.

ZEBRA: Zero-Shot Example-Based Retrieval Augmentation for Commonsense Question Answering.

Francesco Maria Molfese, Simone Conia, Riccardo Orlando, and Roberto Navigli. In Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing: EMNLP 2024, Miami, Florida, USA.

CNER: Concept and Named Entity Recognition.

Giuliano Martinelli, Francesco Molfese, Simone Tedeschi, Alberte Fernández-Castro, and Roberto Navigli. In Proceedings of the 2024 Conference of the North American Chapter of the Association for Computational Linguistics: NAACL 2024, Mexico City, Mexico.

CroCoAlign: A Cross-Lingual, Context-Aware and Fully-Neural Sentence Alignment System for Long Texts.

Francesco Maria Molfese, Andrei Stefan Bejgu, Simone Tedeschi, Simone Conia, and Roberto Navigli. In Proceedings of the 18th Conference of the European Chapter of the Association for Computational Linguistics: EACL 2024, St. Julian's, Malta.