Rome (RM)
Date of birth:
07/09/1996
matteo.cacioppo7@gmail.com

LinkedIn:
matteocacioppo
GitHub:
matteocacioppo
Tel: (39) 333-9680840

Matteo Cacioppo

EDUCATION

Master of Science in Physics   **October 2022 - January 2025**
La Sapienza University

Thesis: LSTM Neural Network for Real-Time Motion Artefact Correction in MRS Scans
Grade: 110/110 cum laude
Advisor: Prof. S. Giagu

Bachelor of Science in Physics   **October 2015 - November 2022**
La Sapienza University

Thesis: Spettroscopia Raman nel dominio delle frequenze ed in trasformata di Fourier
Advisor: Prof. T. Scopigno

Scientific High School Diploma (Liceo Scientifico), Italy   **September 2010 - June 2015**

WORK EXPERIENCE

Research Fellowship   **September 2025 - Ongoing**
ENEA, Frascati Research Center
Project title: "Development of Artificial Intelligence systems for the generation of machine learning algorithms in smart node networks, pattern and feature analysis in data series, and research support using Large Language Models (LLMs)"

PROJECTS

Research on machine learning for Artefact Correction in MRS   **2024**
Master of Science's Thesis

- Implemented an **LSTM-based neural network** to predict patient movement based on navigator data.

- Utilized **affine transformation parameters** to correct spatial misalignment in MRS signals.

- Designed a deep learning pipeline for **real-time motion prediction** to improve scan quality.

- Evaluated the model on patient data to assess its effectiveness in **noise reduction and artefact correction**.

- Contributed to the **RECENTRE project**, aiming to enhance the robustness of high-resolution MRS imaging.

LIS Gesture Classification using LSTM and Feature Fusion **2025**
Participant – MSLR 2025 ICCV Workshop Challenge (Kaggle)

- Developed an **LSTM-based neural network** to classify 126 Italian Sign Language gestures.

- Extracted features from **RGB and radar modalities** using pre-trained and custom CNNs.

- Implemented **late fusion** to combine multimodal features before temporal modeling.

- Handled variable-length videos through **padding and packed sequences** for efficient training.

- Explored different fusion strategies and evaluated the model on the official test set using **accuracy** and **best epoch** metrics.

Graph Coloring with Graph Neural Networks **2023**
Academic Project

- Implemented a **Graph Neural Network (GNN)** using the Deep Graph Library (DGL) to solve Graph Coloring Problems (GCPs).

- Designed a model where each node is assigned a **probability distribution over colors** via a one-hot encoding and softmax normalization.

- Employed **mean aggregation** and **ReLU activation** in the message-passing layers to update node features.

- Defined a **physics-inspired loss function** based on the Hamiltonian of the Potts model to encourage distinct color assignments among adjacent nodes.

- Added an auxiliary metric to **count incorrect color assignments** for evaluation during inference.

- Applied **dropout regularization** and trained the model using PyTorch's backpropagation; final color predictions are obtained with `argmax` over output vectors.

SKILLS
Programming	Python, PyTorch, LaTeX – advanced
	C, C++, R – basic
Communication	Italian (native), English (high level)
Other	GitHub, Git, Docker, Linux

SCIENTIFIC CONTRIBUTIONS

Conference proceeding: Cacioppo M., Giagu S., Argiento B., Capuani S. et al. *"Real-Time Motion Correction in Magnetic Resonance Spectroscopy: AI solution inspired by fundamental science"*
arXiv:2509.24676 (2025); Poster presented at *EuCAIFCon 2025*, Cagliari, Italy, June, 2025.