

MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2026-2027

(internship from January to June 2027)

Host laboratory: Lyon Neuroscience Research Center, 16, av. du Doyen Lépine, 69676 Bron

Host team : IMPACT (<https://www.crnl.fr/fr/equipe/impact>)

Internship supervisor : Emiliano Macaluso, emiliano.macaluso@univ-lyon1.fr

Project title : Internal knowledge as a source of attention control

Project summary :

Attention selects information when multiple stimuli compete for processing resources. Traditional laboratory experiments make use of simple and context-free stimuli, which is in striking contrast with any everyday life situation. In the real world, objects and events are part of complex and meaningful contexts, and both general semantic knowledge and information arising from personal experiences (episodic memory) may contribute to attention control. The current project combines innovative behavioral protocols (encoding in the real world, using mobile phones), computational approaches (estimation of semantic competition using word embedding) and functional neuroimaging to track the influence of high-level knowledge on the brain systems responsible for controlling the allocation of visuo-spatial attention.

During the internship the student will participate to the collection and the analysis of behavioral and imaging data. Although the general trajectory of the project has already been defined, the student will be able to decide which lines to explore in greater depth, both in terms of models for characterizing episodic and semantic memory signals, and with regard to the use of non-conventional techniques for analyzing the fMRI data.

Students interested to learn more or explore potential project directions are encouraged to reach out to me for further details and discussion.

3-5 recent publications :

- Foudil SA, Macaluso E. The influence of the precuneus on the medial temporal cortex determines the subjective quality of memory during the retrieval of naturalistic episodes. *Sci Rep.* 2024 Apr 4;14(1):7943.
- Beffara B, Hadj-Bouziane F, Hamed SB, Boehler CN, Chelazzi L, Santandrea E, Macaluso E. Separate and overlapping mechanisms of statistical regularities and salience processing in the occipital cortex and dorsal attention network. *Hum Brain Mapp.* 2023 Dec 15;44(18):6439-6458.
- Foudil SA, Pleche C, Macaluso E. Memory for spatio-temporal contextual details during the retrieval of naturalistic episodes. *Sci Rep.* 2021 Jul 16;11(1):14577.
- Salsano I, Santangelo V, Macaluso E. The lateral intraparietal sulcus takes viewpoint changes into account during memory-guided attention in natural scenes. *Brain Struct Funct.* 2021 May;226(4):989-1006.