MASTER 2 Fundamental and Clinical Neurosciences

Internship proposal 2024-2025

(internship from January to June 2025)

Host laboratory: *Name + address*
Lyon Neuroscience Research Center (CRNL)
Impact team, 16 avenue du Doyen Jean Lépine, 69500 Bron, France

Host team: *team name + website*
Impact team, 16 avenue du Doyen Jean Lépine, 69500 Bron, France
https://www.crnl.fr/fr/equipe/impact

Internship supervisors: *name + position + email*
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Project title:
Reading the thinking brain: decoding verbal and visual thinking from MEG signals

Project summary: *approx 10 lines*
Human thoughts can be described using several dimensions, including content (what we think about), modality (how we think about it) and intensity (how strong, how clear are our thoughts). The purpose of this internship will be to decode these three dimensions during guided or spontaneous thinking in a group of healthy participants involved in thinking tasks. In these tasks, participants are instructed to think about specific objects (task 1) or anything they want (task 2). On every trial, they choose between developing an internal dialogue or visual imagery. Finally, they report the intensity of their thoughts. Machine learning algorithm will be applied to their brain signals recorded with magnetoencephalography (MEG) to predict, for each trial, the content, modality and intensity of their thoughts. The spatio-temporal neural signatures of these content, modality and intensity will also be described. Experience with Python (or willingness to learn) is recommended.

3-5 recent publications :

1. Toma M, Mattout J, Quentin R, Rassoulou F, Gautier A, Maby E, Vernet M (2023) Humans progressively feel agency over events triggered before their actions. bioRxiv 2023.12.01.569449. https://doi.org/10.1101/2023.12.01.569449
2. Kong G, Aberkane C, Desoche C, Farnè A, Vernet M (In Press) No evidence in favour of the existence of 'intentional' binding. *Journal of Experimental Psychology: Human Perception and Performance.* (accessible on *bioRxiv* 2023.02.06.526214) https://doi.org/10.1101/2023.02.06.526214
3. Vernet M, Quentin R, Japee S, Ungerleider LG. (2020) From visual awareness to consciousness without sensory input: the role of spontaneous brain activity. *Cogn Neuropsychol,* 37 (3-4), 216-219. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7335319/