**Special exercise 1: essay (50 points)**

As one half of the special assignment, your task is to write an essay (2-3 pages) about the use of a neuroimaging technique in clinical practice and clinical research. You are free to choose between EEG, cryo-MEG, OPM-MEG, MRI, fMRI, and PET.

The essay should describe the method and its applications in more detail than was covered in the lectures. I will upload several review articles for each of the methods; you can also additionally use textbooks, YouTube videos, Google search, and so on. Using Wikipedia is allowed, but Wikipedia is not always correct, nor up to date; there are better sources. Use of ChatGPT and other AIs is discouraged; they also are often inaccurate when it comes to science. In any case, do not copy-paste text directly from AI into your essay!

If you find scientific articles online that look interesting but which you cannot access, feel free to message me, and I will see if I can get access and share them.

Cite the main references that you used, for the whole article and for specific examples that you emphasize (these can also be references that are given within a review article). For articles, give citation as first author + year + journal, for online content, the link.

The content of the essay should be roughly:

**Advantages and disadvantages of the method**: What are the inherent strengths and weaknesses?

**Methodological challenges and advances**: Which are common problems that arise in the use of this method and in processing and analyzing data? Which improvements have been brought forward in the last 10-20 years in technology and/or analysis?

**Established and suggested clinical use**: How is the method used commonly in hospitals, and with which disorders? Which applications may arise in the near future? (If there is little or no established clinical use, focus on suggested applications).

**Clinical research**: How has the method been used, or may be used in clinical neuroscience studies to investigate how brain activity is altered in these disorders? Give some interesting examples.

**Relationship with other techniques**: How can this method be combined with other neuroimaging methods, or other methods for diagnosis and/or scientific investigation of their causes and treatment?