Questions exercise 7

1. What is the “placebo effect” and how is it relevant for clinical trials? (6 points)
2. What are typical indications that your machine learning algorithm has been either over- or underfitted? What can you do in these cases to improve the algorithm? (8 points)
3. Suppose you have recorded neuroimaging data from an ADHD population. Symptoms in your patients have been assessed with the ASRS scale. Describe which approach you would choose to investigate this data with machine learning. (6 points)
4. From a patient health perspective, would it be preferable if your machine learning algorithm has a larger FN rate or a larger FP rate? (5 points)
5. Suppose you train a classifier on 3 groups of similar size in your patient population and a classifier that achieves 52% accuracy on the test set. Is this result larger than expected by chance? Is it clinically useful? (5 points)
6. What are the advantages and disadvantages of circular coils, figure 8 coils, and H-coils for TMS? (6 points)
7. Which problems can occur when using purely random splitting of subjects into training, validation, and test sets? (4 points)
8. Suppose you want to analyze TMS-evoked potentials, and TMS-induced responses across multiple trials; what would you need to consider? How would your analysis differ between the one and the other? (6 points)
9. Which form of stimulation of the brain / nervous system are used to aid with stroke rehabilitation? (4 points)