Description of the prompting strategies

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To prompt ChatGPT, I adapted three strategies from [1]. This paper provides a set of interesting ways of giving instructions to ChatGPT. My instructions were formulated as follows:

1. *"When you are asked a question, generate three additional questions that would help you give a more accurate answer. Answer all questions and combine the answers to one final answer. Compare it with choices and output a correct choice."* This strategy helps ChatGPT to divide a big question into smaller ones to focus on the most important aspects.

2. *When you generate an answer, create a set of facts that the answer depends on that should be fact-checked and list this set of facts at the end of your output. Only include facts related to neuroscience. Based on those facts, choose a correct answer from the choices provided.* This strategy helps the user to check some facts from the chat's response especially if the user is not familiar with the topic.

3. *When you provide an answer, please, explain the reasoning and assumptions behind your answer. If possible, provide some examples. Also, address any potential ambiguities or limitations to make your response more accurate. Finally, choose a correct answer from the choices provided.* This strategy helps the user to follow the logic behind the response and evaluate how convincing it is.

For each question, I generated responses using each of the three instructions, compared the answers in terms of how scientifically convincing and coherent they were, and chose the one I liked the most. I asked additional questions when I saw some inconsistencies. A good example of this is an open question 37801 (the last one in my submission file) in which we were trying to compute the membrane potential.
After all, the third strategy was found to provide the most scientifically convincing answers. I used it for 66 questions. However, for question 37791, ChatGPT was not able to provide an answer with this instruction (due to lack of information) while it was possible with others.
Additional questions generated using instruction 1 indeed help to understand the initial question, however, it is not always clear how the answers to additional questions imply the final one. Among interesting failures of this strategy are questions 37910 and 37808, for which ChatGPT generated a correct response but in the end chose an incorrect option.
The responses generated with strategy 2 usually agree with the ones for strategy 3. An example of where it was not true is question 37932 for which responses 1 and 3 were the same but with instruction 2, ChatGPT chose a different option.
An advantage of comparing three responses is that it helps to assign a confidence score: if all three responses agreed my confidence was higher than when they disagreed.

References

[1] Jules White et al. *A Prompt Pattern Catalog to Enhance Prompt Engineering with ChatGPT*. 2023. URL: arXiv:2302.11382.