

User Study:

We are conducting a user study to evaluate the impact of real-time TMS visualization on expert perception and evaluation of TMS treatment parameters and potential clinical outcomes. TMS is a non-invasive neuromodulation technique used in the treatment of various brain disorders.

The participation in this study involves:

- Reviewing the real-time visualization method and becoming familiar with the software tools used.
- Evaluating and providing feedback on the usability, functionality, and effectiveness of the real-time visualization in TMS treatment planning.
- Engaging in a structured interview or completing a questionnaire to share your expert opinions and insights.

The study will consist of two parts.

E1's Answers

E2's Answers

E3's Answers

E4's Answers

Tasks:

PART 1:

You will now be shown an image of a TMS visualization. Meanwhile, you will be answering the questions. Please let the study advisor know when you start a question and then your answer, so that they can note them.

1. Can you tell in which brain region the electric field is shown?

Left hemisphere parietal lobe

Left temporal lobe

Left ipI

Left hemisphere

2. Can you tell the angle of the coil?

Can't tell

Depending on the angle, maybe slightly tilted 45 degree angle

Can't tell, what coil is it? Guessing handle is towards the floor

Can't tell, probably somehow perpendicular

3. Can you tell the highest strength of the electric field?

Red in the center, 0.378

Red where it diffuses out, strength probably like in color legend?

Central area red and orange, around 0.3

Red area, 0.3 something

PART 2:

You will now be able to interact with a TMS visualization tool called SlicerTMS. Same as before, you will be asked to perform a few questions and perform tasks. Please let the study advisor know once you start with a question and then your answer, so that they can note them after each task and measure the time you needed to complete it.

1. Can you place the coil in a 45-degree angle on the left hemisphere of the frontal lobe?

1.04 minutes

1.50 minutes

1.20 min

2.01 min

2. Can you retrieve the mm values of the volume from the red(S),green(A) and yellow(R) 2D slices, where the electric field has the highest values?

35.5, 47.5, 26.5, 1.35 min

-9.8, 61.5, 16.45 mm 2.04 min

41.5, 47, 26.5 35 sec.

31,5, 33.5, 48.5, 23.04 sec.

3. With the electric field of the coil, can you stimulate the primary motor cortex/motor hand area of the brain?

36.21 sec

40.07 sec

1.08 min

51.04 sec

4. Next, in this area, by moving and adjusting the coil can you moderate the electric field intensity to values between 0.0 and maximum 0.3?

28.32 sec.

44.39 sec.

26.74 sec.

1.33 sec.

5. Can you now remove the Mesh and show the Fibers instead?

7.73 sec.

3.51 sec.

7.01 sec.

16.75 sec.

6. Lastly, can you move the coil along the fibers of the corpus callosum from the front to the back?

41.69 sec.

56.22 sec.

27.73 sec.

26.83 sec

Next, you will be sent a quick post questionnaire in Google forms via mail to access some information about the tools and how you perceived their usability/interaction and visualization.