

Intracranial EEG Phantom for Brain Stimulation Studies

Date: 9/11/2025

Client: Dr. Raheel Ahmed

Alternative Contact: Dr. Arun Karumattu Manattu

Advisor: Dr. Paul Campagnola

Team:

Avery Schuda (*Team Leader*)

Lilly Mackenzie (*Communicator*)

Helene Schroeder (*BSAC*)

Orla Ryan (*BWIG*)

Corissa Hutmaker (*BPAG*)

Problem statement

Intracranial electroencephalography (iEEG) is routinely used in surgical planning for individuals with uncontrolled seizures. Transcranial magnetic stimulation (TMS) may provide complementary information for mapping out critical brain regions that should be avoided during surgery, however, there are still safety concerns around the use of TMS in patients with iEEG. The major safety concerns are the induction of electrical currents, heating, and displacement of the implanted electrodes. The goal of this project is to develop a phantom that can be used to simulate the effect of TMS on electrode currents, temperatures, and changes in position.

Brief status update

This week the team focused on background research and preparing for the first client meeting in order to better understand the project.

Difficulties / advice requests

Assistance with defining quantitative values/ranges related to the product specifications would be helpful for the PDS.

Major team goals for the next week

1. Attend first client meeting
2. Work on writing the Product Design Specifications (PDS)
3. Continue research to inform the PDS and better understand the problem

Next week's individual goals

- Avery
 - Aid team in completing the PDS
 - Continue researching background and specifications relevant to the PDS
- Lilly
 - Work on PDS based on information from client meeting
 - Continue reserching and brainstorm initial designs/solutions
- Helene
 - Continue background research for the PDS
 - Brainstorm initial ideas for the design
- Orla
 - Brainstorm individual ideas and meet with team members to write the PDS
 - Keep the team website updated with any progress
- Corissa
 - Do more research for PDS and other upcoming deliverables
 - Complete PDS with team
 - Start thinking about initial product designs

Timeline

[illegible]

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