



Master Thesis Project



The Research group „[Brain structure and function in neuropsychiatric disorders](#)“ of the Neuroradiology Department at the Klinikum rechts der Isar is looking for a motivated Master Student to do their Master Thesis in collaboration with our lab.

The work will be within a project investigating the effects of transcranial direct current stimulation (tDCS) on the impaired inhibitory ability and the underlying neuronal substrates in patients with OCD. This data is acquired using simultaneous MRI examination and tDCS stimulation.

Project:

The proposed work consists of writing code which automatically calculates the center coordinates of both electrodes within the 3D brainmesh exported to matlab. The two electrodes protrude 2mm out of the head, which allows us to visually separate them from the head. Currently this step of the electrode localisation pipeline (Figure 1) is not automatic. Different approaches based on curvature values and matlab clustering functions have been attempted with limited success on all subjects. Possible solutions require additional tweaking. Upon completion, this pipeline will serve to further investigate the role of anatomical variety and electrode placement on electric field intensity and focality induced in the participants. Analysis which you would also participate in.

Requirements:

- some experience in coding python and matlab
- Eagerness to learn new imaging techniques
- Affinity for problem-solving
- Interest in computer vision approaches

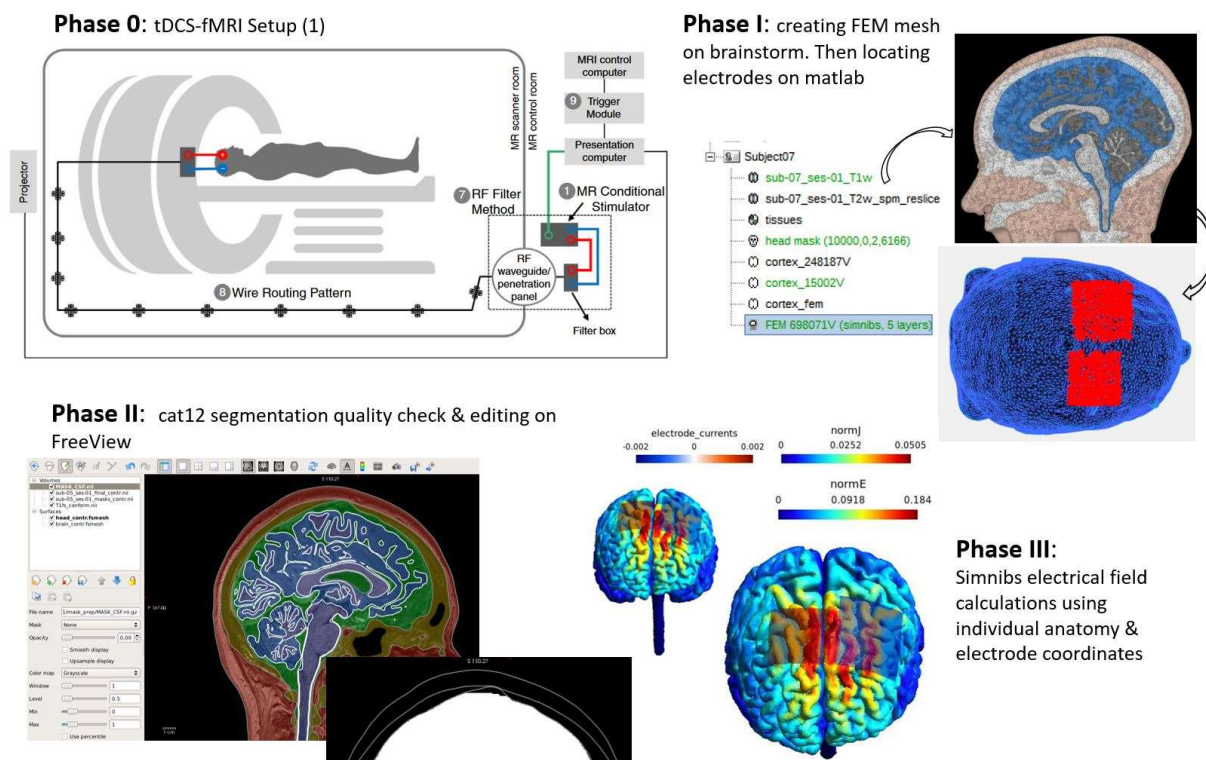


Figure 1. Visualisation of workflow. (transcranial direct current stimulation=tDCS, functional magnetic imaging=fMRI, finite element method=FEM)

For those students who are interested in Data Acquisition we are also able to provide hands-on experience in the concurrent tDCS-MRI Setup. However, this is not a requirement for the role.

There would be an additional option to combine the Thesis with a 7 hr student Research Assistant position, if you speak conversational German.

For further information and to express your interest, please contact the doctoral student responsible for the project:

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Doktorandin an der Graduate School of Systemic Neurosciences LMU

(https://www.neurokopfzentrum.med.tum.de/neuroradiologie/forschung_projekt_neuro-psychiatrisch.html)