

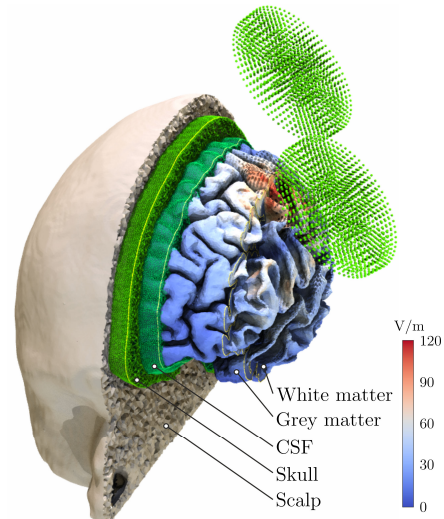


## Master Thesis

# A novel dosing method for Transcranial Magnetic Stimulation

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Transcranial magnetic stimulation (TMS) is a method to modulate motor and cognitive functions in the human brain. Stimulation intensity is usually calibrated to the excitability of the primary motor hand area by using the individual **resting motor threshold** (MT). Therefore, the current dosing method is defined on the basis of stimulator intensity rather than the **induced electric field**, which actually causes the behavioral effect. The electric field, however, varies considerably depending on the targeted brain region and coil position due to the **complex geometry** and **individual anatomical differences**.



In the present project, we aim at developing a novel dosing method that leverages modern computational modeling approaches to determine individual stimulation intensities based on the individual brain anatomy. We plan to experimentally validate this method in the cognitive domain, targeting the temporoparietal junction (TPJ) in healthy subjects.

We expect that our novel approach will significantly reduce the observed inter-individual variance of the response to TMS, thereby increasing the validity of TMS in cognitive neuroscience.

We are seeking for a master's student with a background in experimental psychology or cognitive neuroscience and interest in computational modeling.

### Tasks:

- Familiarization with the simulation environment *SimNIBS* and our in-house python routines for pre-and postprocessing *pyfempp* (Python)
- Conducting and comparing TMS experiments using the standard and novel dosing approach

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