visor²™

Product application brochure

Presurgical functional brain mapping with navigated TMS
visor2 allows users to evaluate functional organization of the human cortex using non-invasive, navigated transcranial magnetic stimulation (TMS). This innovative solution comes with intuitive workflows and high-precision optical tracking technology, resulting in a color-coded individualized DICOM to be used in surgical planning.

**Product highlights:**

- Highly precise and reproducible e-field neuronavigation for functional brain mapping using individual MRI of the patient
- Non-invasive, online, and step-by-step motor and speech mapping of the eloquent cortex
- Beneficial in maximizing the tumor resection while minimizing the post-surgery risks of aphasia or motor-impairments
- Helpful in saving the Neurosurgeon’s time at the theater to localize the hotspot and the eloquent areas more quickly and efficiently
- Highly configurable workflows (e.g. import of custom images for the naming tasks) toward individualized mapping protocols
- Compatible with stimulators from all major TMS manufacturers

**Motor mapping**

visor2 integrates navigated TMS and EMG recording with real-time 3D visualization of stimulated brain areas. Evoked motor responses are projected onto patients’ anatomical MRI to create functional maps relating to the relevant cortical areas. Supported by a real-time estimation of TMS-induced electrical fields, visor2 calculates and highlights targeted locations. The evoked motor responses are processed online and the calculated amplitude is projected onto an image of the stimulated cortical location to generate functional maps. The generated maps or single MEP responses can be exported in 3D image formats such as in DICOM for use in surgical navigation systems.

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Speech mapping

visor2 can be used to map language-eloquent areas via visual naming tasks for use in presurgical evaluation or in clinical research related to language comprehension. visor2 delivers a dedicated three-step workflow to support the user in this complex procedure.

During the first step:

An easily customizable stack of images is presented to the patient in a naming task. Both audio and video recordings of speech and facial reactions to each image are recorded.

In the second step:

The same naming task is repeated and recorded while navigated repetitive TMS (rTMS) is applied to the eloquent cortical speech area. When short bursts of rTMS are applied to cortical speech sites during speech production, either speech errors (e.g. speech arrest) or accurate responses are noted. This step serves as the baseline for the actual stimulation step.

In the third step:

Recordings from step one and step two are compared, and responses in step two are individually categorized according to the specific type of speech response. Categories can be customized to fit each user’s specific needs. After classification, response maps can be overlaid onto the subject’s anatomical MRI and exported in 3D image formats (e.g. DICOM) for use in surgical procedures.