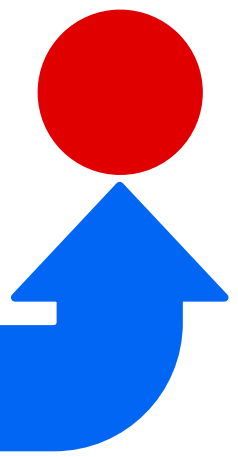


Neural Navigator



Know where you go with TMS



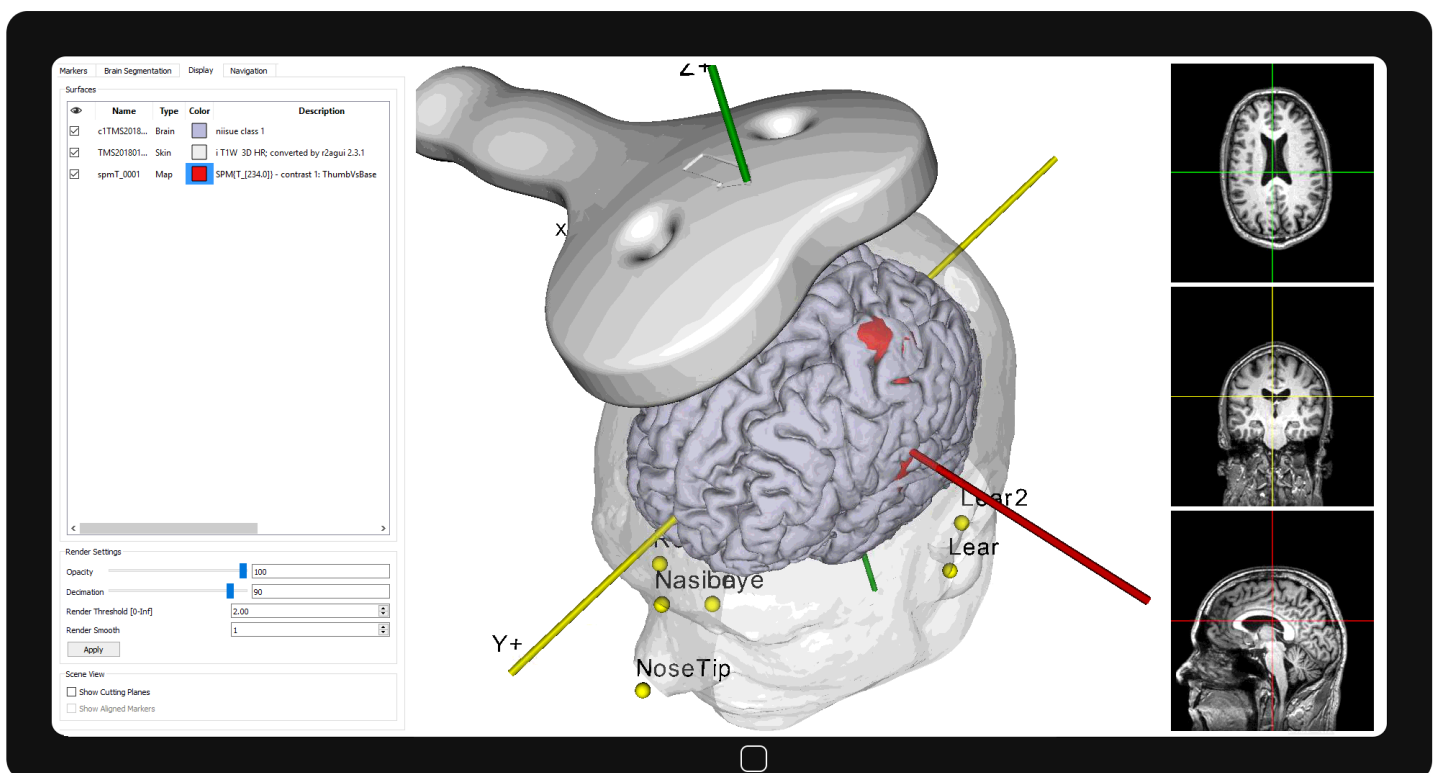
- MRI-guided navigation of TMS treatment
- Built-in segmentation
- Certified for medical use in Canada, EU & more



THE NEURAL NAVIGATOR

The Neural Navigator is designed to guide Transcranial Magnetic Stimulation (TMS) in order to precisely stimulate a brain region. Using the patient's own MRI scan, the TMS coil can be navigated toward the target brain region with millimeter precision. Neuronavigation has been shown to improve TMS treatment of major depressive disorder, resulting in better treatment outcomes.

The Neural Navigator is easy to use, offers exactly what you need and is certified as a medical device in the European Union, Brazil, Canada and Australia. It adopts a well validated registration technology and has been rigorously tested. The Neural Navigator has been actively used since 2004 in many labs around the world.

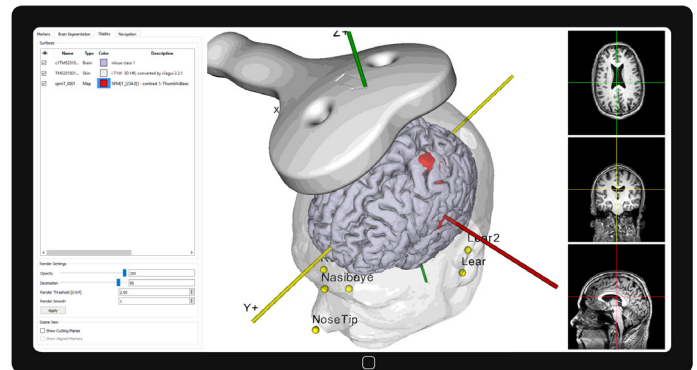


MAIN COMPONENTS



Magnetic position tracking: BrainTRAK™

The position of the TMS coil and the patient's head is tracked using the BrainTRAK™, a magnetic position tracking device built into the Neural Navigator. It is smaller than a laptop, unlike large optical tracking systems. It uses magnetic induction tracking with a weak pulsed DC magnetic field. This technique is hardly sensitive to electromagnetic distortions, the presence of a normal TMS coil does not distort the measurements. The magnetic field is generated by a transmitter cube.



The Neural Navigator software

The Neural Navigator software is a comprehensive software suite with several workflows for image processing, visualization and real time navigation. It runs on Windows 7 and Windows 10.



Coil Sockets

Several coil sockets are available, that can be mounted rigidly on a TMS coil handle. In the socket our position tracking sensor is mounted. There are several models available for coil models by Neurosoft, MagStim and MagVenture.



Hand-held pointer

This hand-held pointer is used to measure facial landmarks before navigation, which tell our software where the real patient head is located. It has one of the tracking sensors mounted into it.

ACCESSORIES (optional)



Head Support

Our table mounted head support consists of a chin rest, a forehead rest and a magnetic field transmitter pad. It is most applicable to behavioral TMS experiments occurring in psychology or neuroscience labs. It helps perfectly fixating the head so that brain regions are targeted accurately. It is CE certified as a medical device class I.



TMS Treatment Chair

This reclining chair is especially designed for use during navigated rTMS treatment. The magnetic field transmitter of the BrainTRAK™ unit is mounted to the back of the chair on a special pad. The materials in the chair are chosen such that magnetic tracking is undisturbed, which was rigorously tested. A special head support that can be mounted on the top surface of the chair lifts the head up allowing easy navigation. This product is CE certified (class I) for clinical use.

SPECIFICATIONS

The Neural Navigator can target brain areas indicated on an MRI scan with a precision of 4 mm or better. It can load and visualize individual MRI scans, tissue maps (e.g. gray matter), fMRI activation and craniotopic facial markers. One can navigate the TMS coil to the target in the brain in real time while looking at the screen. On the screen a 3D rendering of the TMS coil and brain are shown exactly at the position and orientation where they currently are. A yellow beam is shown at the center of the TMS pulse, extending into the brain. This allows one to see exactly which area is targeted. Pre-set neuroanatomical target markers can be pinpointed accurately. The virtual camera can also be linked to the TMS coil center to obtain a birds-eye view of the brain as if you are looking down along the TMS pulse, with a crosshair to aid targeting of the brain region of interest. Furthermore, The Neural Navigator contains tools to judge navigation accuracy, make suggestions how to improve it based on real-time simulations, test the 3D digitizing hardware, and many more.

Supported MRI data types

The Neural Navigator is fully compatible with the Nifti 1.0 data format that is prominent in MRI research. Nifti files, appearing with .nii and .img/.hdr extensions, are the standard data format used in SPM5 and SPM8. The software can also read the older Analyze format used in SPM9 and SPM2. The software also reads Nifti data from more recent AFNI, FSL and Brainvoyager versions. DICOM data can also be read directly by the Neural Navigator. We advise the use of the Nifti format for optimal compatibility between image modalities.

Position tracking hardware

The BrainTRAK™ position tracking device digitizes 3D position and orientation of the hand held pointer and the TMS coil at a rate of 100Hz. It adopts a weak pulsed DC magnetic field generated by a small emitter, and measures magnetic induction in the sensors located inside the pointer and TMS coil socket to determine location and orientation. The spatial accuracy is better than 1 mm within a range of ~70cm from the transmitter. The tracking hardware operates in a stand-alone case, with its own power supply, and connects to the PC or laptop through a USB port. The system can be used in combination with a laptop, greatly increasing mobility. The complete navigation setup fits in a regular sized suitcase, which makes it ideal for bed-side investigations.

Technical

Electrical: Power line 100 - 240V ~ 50/60 Hz; input power 50 VA. Type: Class I Device with Type B Applied Part (probes). Installation class 2, Safety class 1. Operation environment: temperature 5°C to 40°C; between 10% and 90% non-condensing humidity; Maximum allowed height 2000m, maximum air pressure 79.4 kPa. Storage/transportation conditions: ambient air temperature between -40 °C and 70 °C in environments with a relative humidity between 5% and 95%. IP class: IP20. MDD Device class: IIa

Regulatory

The Neural Navigator is CE certified as a class IIa medical device in the European Union, InMetro and ANVISA certified in Brazil, Health Canada certified for medical use in Canada and TGA certified for medical use in Australia. In these regions the Neural Navigator can be used for clinical purposes. The Neural Navigator as an electrical medical device is IEC606011 3rd edition (Electrical Safety) and IEC60601-1-2 3rd edition (electromagnetic compatibility) compliant. RoHS and WEEE compliant

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