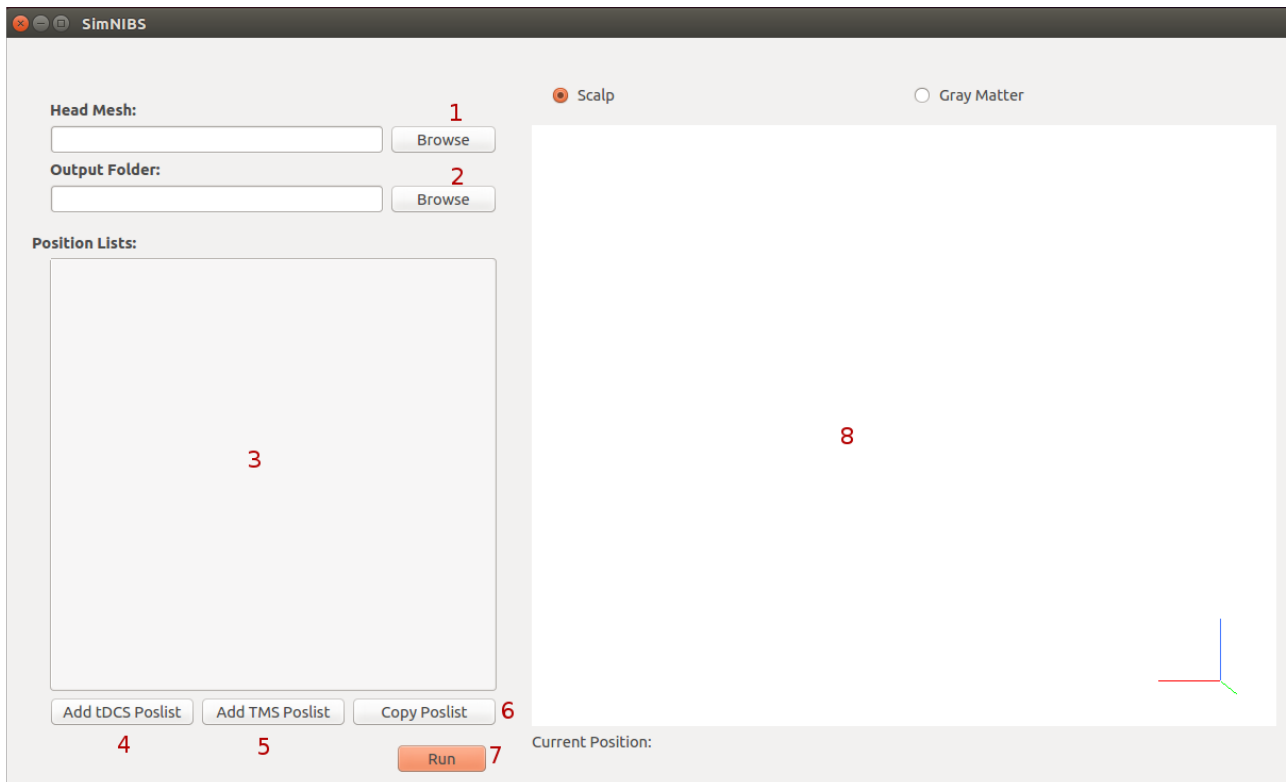


How to use SimNIBS GUI

The Main Window

To start the GUI, open the Terminal. The message
setting up paths for SimNIBS 2.0.1

Should appear. Type `simnibs_gui` in terminal, and the following window will appear:

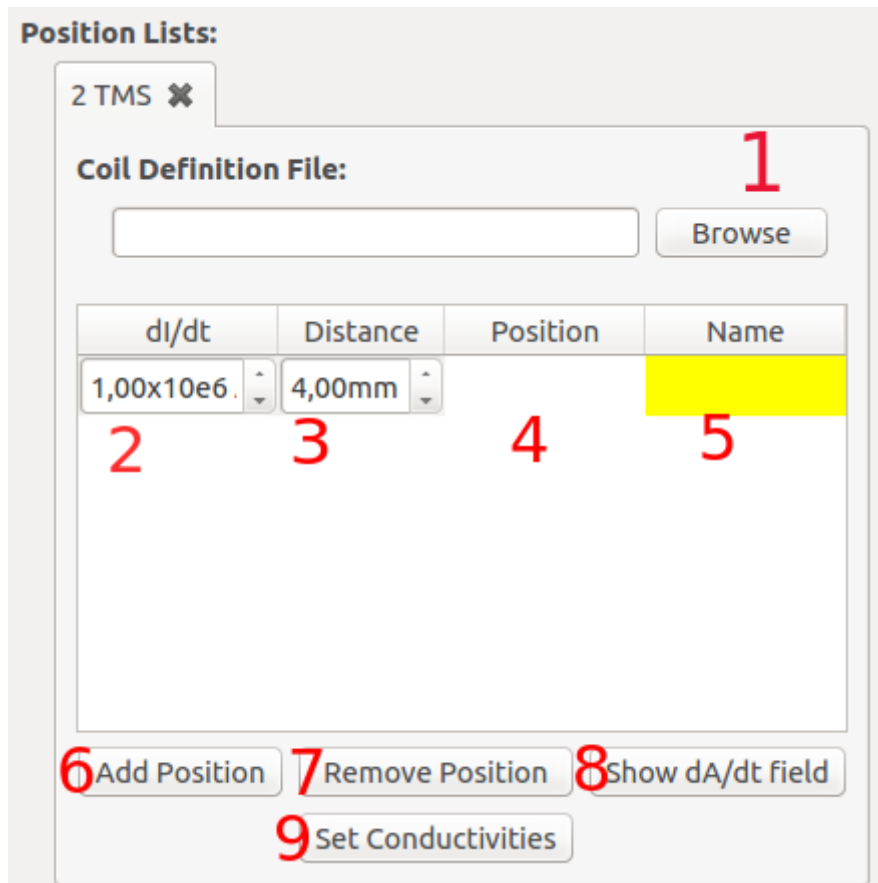


The appearance may change depending on your OS

- (1) Select a head mesh
- (2) Select an output folder for the simulations
- (3) Widget showing the TMS and tDCS simulations to be ran.
- (4) for defining a new tDCS simulation
- (5) for defining a new TMS simulation
- (6) for copying a TMS or tDCS simulation
- (7) Run Simulations
- (8) Head model selected in (1). You can rotate the model using the left mouse button, translate using the right one and zoom using the mouse wheel. You can change the model colors in Edit → Select Model Colors

Position Lists

TMS Poslist

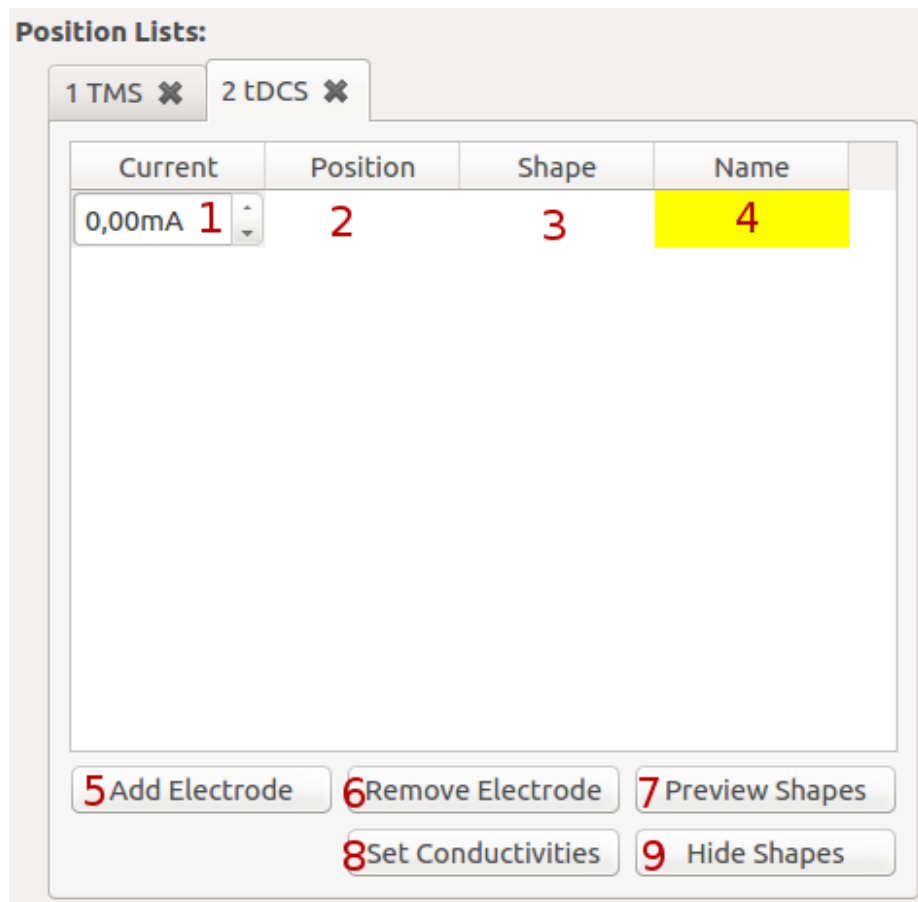


A TMS

Position List is composed by various coil positions, with all of them sharing a coil and a set of conductivities

- (1) Select a coil file
- (2) Select the pulse intensity
- (3) Select distance to head
- (4) Click twice for selecting coil position and orientation
- (5) Type a name for the position (Optional), coil color code
- (6) Add another position to the bottom of the list
- (7) Remove the current electrode
- (8) Preview the dA/dt field, in the head model. Only works for nifti coil definitions
- (9) Set the tissue conductivities and brain anisotropy

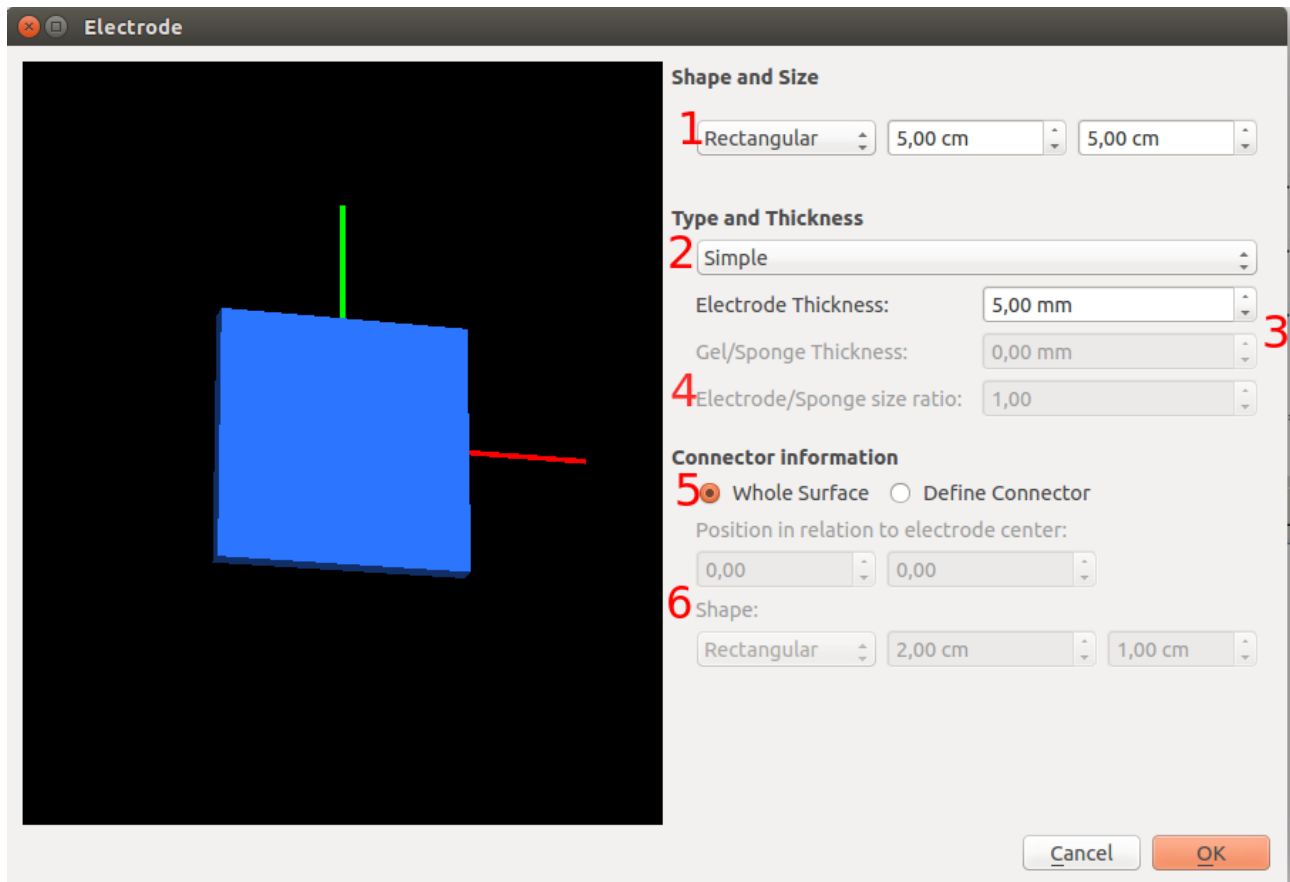
tDCS Poslist



Select the current flowing through the electrode by (1). Positive values indicate the electrode is a cathode, negative values, anode. The sum of the currents flowing through all the electrodes must be zero

- (2) click twice for selecting position and orientation
- (3) Click twice for selecting electrode shape, size and type
- (4) Name the electrode (Optional), color code
- (5) Add another electrode. The number is unlimited.
- (6) Remove the current electrode
- (7) Preview the electrode shapes in the head model
- (8) Define the tissue conductivities and brain anisotropy
- (9) Hide electrode shapes

Electrode



(1) Electrode shape may be rectangular or elliptical. The “sizes” correspond to the length of the edges in rectangles and the length of the major axis in ellipses

(2) Electrodes may be of 3 types:

1. Simple: Just one layer
2. Electrode+Gel: 2 layers, corresponding to the rubber electrode and the gel
3. Electrode+Sponge: rubber electrode inside soaked sponge

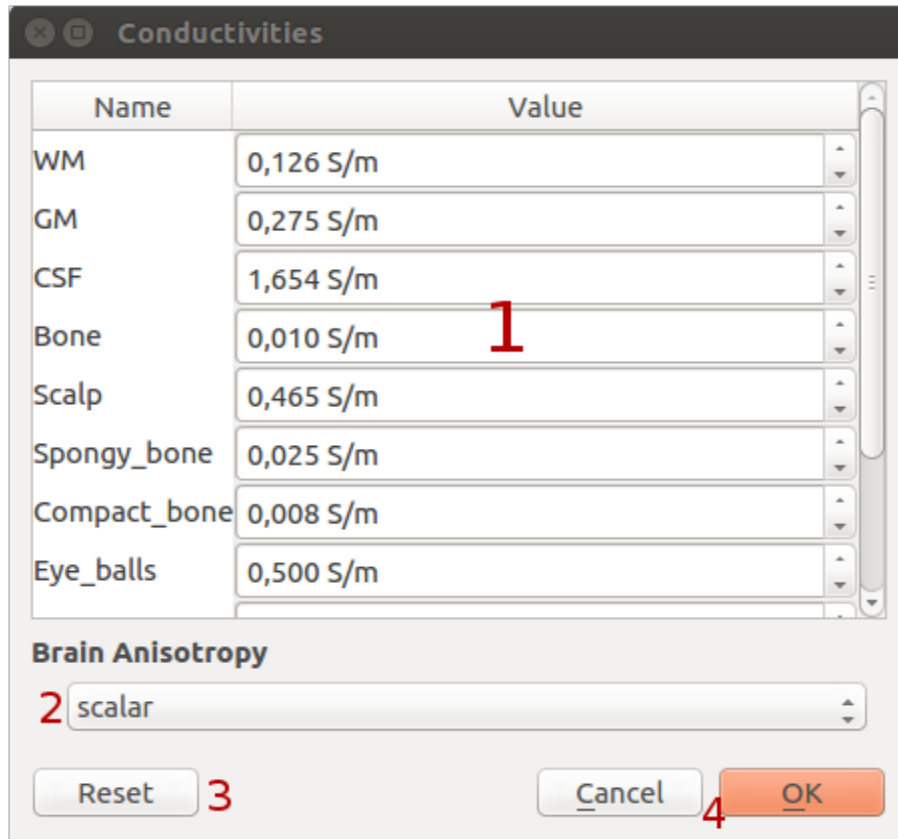
(3) Thickness of the electrode layers

(4) For the Electrode+Sponge electrode, the ratio of the electrode size to the sponge size. The size specified in 1 is the sponge's.

(5) You can select whether or not to model a plug for the electrode

(6) If a plug is modeled, set its dimensions and shape

Conductivities



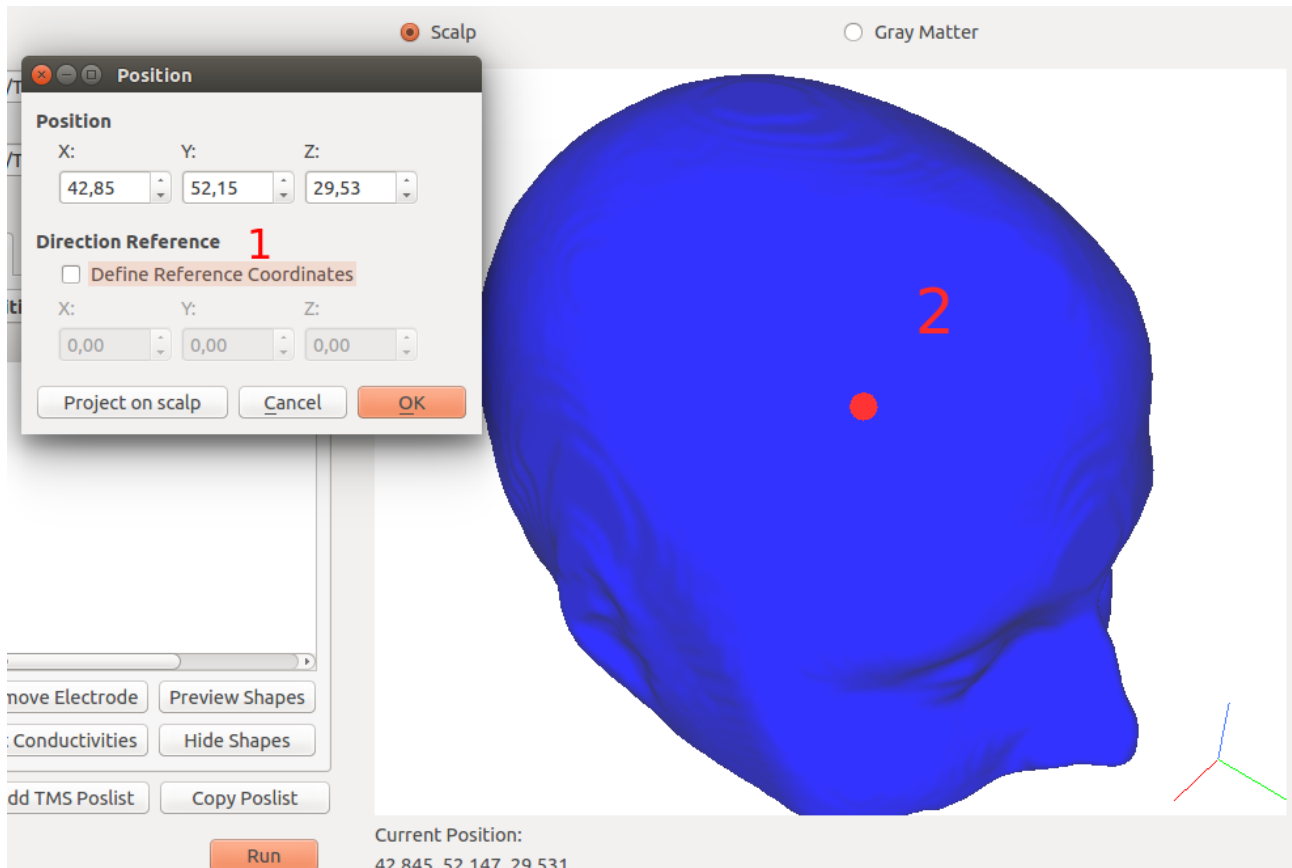
(1) The user may set the conductivities for each tissue. In standard SimNIBS 2.0 models, the tissues for the head mesh are: WM (white matter), GM (Gray Matter), CSF (Cerebrospinal fluid), Bone and Scalp. In tDCS, Electrode_rubber is used in the upper part in electrode+gel models, or to the middle part in electrode+sponge models. Saline is used for the sponge or gel.

(2) is used to select white and gray matter anisotropy. It might be scalar (isotropic), use direct mapping tensors, volume normalized tensors or mean conductivity. For options other than “scalar”, a diffusion weighted MR image must have been provided and processed in “dwi2cond”. You can select the tensor files for options other than “scalar” in Edit → Select Tensor Files. SimNIBS will automatically look for them in the standard path, and select the appropriate files if found.

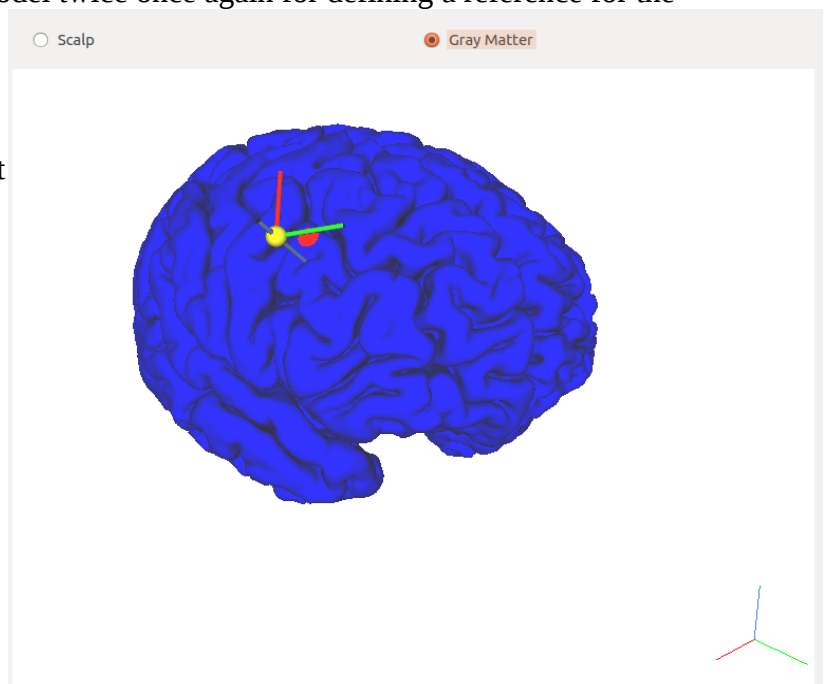
(3) Reset all conductivities to standard values

(4) Accept or reject changes

Position Selection



(1) The window (1) will appear when clicking twice in the “Position” column on either tDCS or TMS Poslists. For getting the position, click in the head model (2) twice for defining the center of the coil or electrode. Then, click in the model twice once again for defining a reference for the electrode y direction (tDCS) or coil handle direction (TMS). The direction will be given by a line connecting the center to the reference point. The “Project on scalp” button will transform the specified position to the closest point in the scalp surface. The direction reference point will be transformed such as the direction is kept. Note that, even when visualizing grey matter, the coordinates obtained by clicking in the model are in the scalp. In order to see how to obtain coordinates in the grey matter surface, please refer to the Visualization in Gmsh tutorial



On the top of the model screen, you can select to visualize gray matter or scalp. Note that, when

selecting position in Gray Matter view, the position indicators will hover above the gray matter surface. This is because the points are actually being selected in the scalp surface.

Running Simulations

You can select the fields you want to simulate or select to keep all temporary files in

Edit → Simulation Options

For running the simulation, click in “Run” in the main GUI window. A new window will pop-up, asking for a filename for a SimNIBS file. The SimNIBS files are Pickle files, with termination “.simnibs”. They hold the information of the position lists, head mesh and output folder. After saving the SimNIBS file, the simulations will start.

You can also open and save “.simnibs” files in

File → Open

File → Save

The .simnibs files can also be used for running simulations in the terminal with the “simnibs” command. For more information, refer to the simnibs documentation