

**ANALYSIS OF FUNCTIONAL MAGNETIC RESONANCE
IMAGING DATA USING SPM99:
LATERALIZATION INDEX**

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SPM: MASKING IMAGES

41. Creating Region of Interest (ROI) masks

Download MARINA from: <http://www.bion.de/Marina.htm>

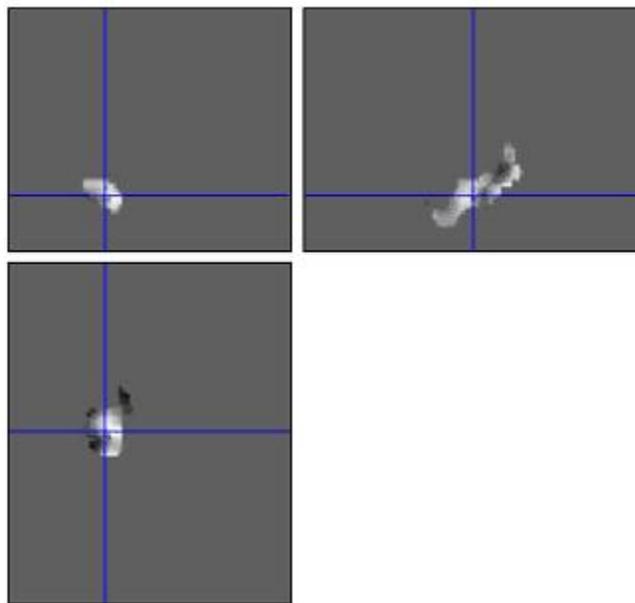
- Run MARINA
- Select region(s) you want in your mask by double-clicking on region name(s).
- Click on the “**create mask**” icon
- Save mask (e.g., **mask*.img**)
- **Outputs:** creates **mask*.img** and **mask*.hdr** files

42. Applying masks to activation images

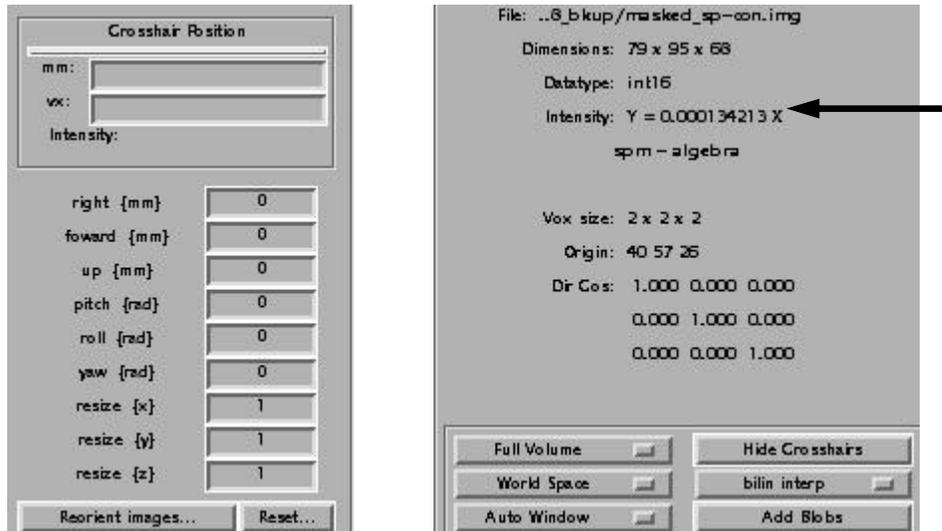
- Select **ImCalc** from main menu
- Select images: Select **mask*.img** file, THEN **spmT*.img** you wish to mask
- Output name: e.g., **s1_LHC_masked**
- Evaluated function: **i2.*(i1>0)**
Note: i1 is the first image you selected (mask) and i2 is the second image you selected (spmT.img)*
- **Outputs:** creates masked image, e.g., **s1_LHC_masked.img**

Display masked activation map

- Select **Display** from main menu
- Select masked image (e.g., **s1_LHC_masked.img**)
- For an image masked with a hippocampal mask, it should look something like this:



- Note down **scale factor**, i.e., the weight applied to the X in intensity equation (e.g., **.000134**).



43. Counting the number of activated voxels within the ROI

- Use **thresh_voxel_count** script (email donnad@psych.utoronto.ca for script)
- In the terminal window type, **thresh_voxel_count scale_factor threshold_t_score < file_name**
- e.g., **thresh_voxel_count .000134 2.35 < s1_LHC_masked.img**
- This will output the number of activated voxels and the total number of voxels in the mask

44. Calculating Lateralization Index

- Once the number of voxels has been counted within the ROI in the left and right hemisphere, the lateralization index can be calculated for each subject.
- Either the raw number of activated voxels in each structure, or the number of activated voxels as a proportion of the total number of voxels within the structure can be entered into the following asymmetry-ratio formula: **[(L-R)/(L+R)]**