

Making AFNI Masks

OK. So, the first question that you're probably asking is "Why do I want to make an AFNI mask?". The answer is that masks in AFNI are used to tell AFNI what part of an image to look at, or use. The equivalent, I suppose would be Stimulate's ROI (Region Of Interest) function, with the exception of AFNI not reporting the averaged time-series graph of a ROI.

Say that you wanted to count the voxels in a certain area of the brain. By creating a mask of that particular area of the brain, AFNI can then proceed to analyze only that specific area for such things as the mean activation of the voxels in that area, the number of voxels in that area, etc.

AFNI masks can be made in several easy steps.

1. You can think of an AFNI mask as a clear plastic sheet that fits over your image to section off a certain area. The sheet needs to be the same size as your picture. Therefore, you must first make a "clear plastic sheet" of the same size as your image. To do this, you can use the AFNI plugin Define Datamode > Plugins > Dataset Copy. In this menu, the Input is the dataset that you want your copy to be made from. The input should be the time-series dataset if you want to use your mask to examine voxels in the time-series dataset, the anatomical dataset if you want to use the mask to evaluate voxels in the anatomical dataset, and so on. The Output is the name of the mask you want to create, and the Data Fill is the kind of mask that you want to make. There are three options for Data Fill. Data [All] will create an EXACT replica of the input dataset, with its voxel values and all. Zero [All] will create a dataset with the same number of sub-bricks, but replacing ALL the values with zero. Finally, Zero [One] will create the same sized dataset, with one sub-brick and replace all the values with zero. This final type is the one used in making a mask, because (later, we will edit the dataset) the dataset editor will only edit datasets with one sub-brick. On top of having only one sub-brick, we want the dataset to be only zeros. This is in essence the "clearness" or our "plastic sheet". (We want a clear "sheet" to modify when editing the mask.) Once you have specified the 3 pieces of information, click on Run+Close. This will create the blank dataset.

2. The next step is to modify your mask. To do this, you will overlay it on a dataset to help guide your drawing where you want to examine. However, because of the way that AFNI works, you can only edit a mask when it is overlaid on the same dataset that the mask was created from. This is why it is important to have created your mask from the dataset that you wish to examine. To edit your mask, select Define Datamode > Plugins > Draw Dataset. This will bring up a new window. The first thing to do is to Choose the mask (Dataset) that you will be editing. Therefore, choose the one that you just created. If

you can't see your mask, make sure that the underlay is the dataset you created the mask from. Next, set a Drawing Value. The drawing value is the number that AFNI will put at each voxel that you draw on. Remember, the mask that you have right now is all zeros, so choose a value other than zero. The Drawing Color is up to you, and makes no difference. The Drawing Mode outline exactly how your drawing tool reacts. An open curve is a simple line tool. Closed curve is a line tool that completes the line from the end point to the start point. This is best for drawing large blobs of interest. Points is exactly what it implies. Once you have decided how you are going to draw on the mask, switch back to the original window and select the Image that you are interested in (axial, sagittal, or coronal). Use the middle mouse button to draw on the mask. If your drawing does not appear on the mask, ensure that the middle mouse button is actually set to 'Middle Button' within the computer's control panel. You may notice that as soon as you draw something, it disappears. This is probably due to the fact that the currently loaded overlay for the underlay is either not your mask, or the See Function button is turned off. To see what you are drawing, you'll need to have your mask loaded as the overlay (Switch Function), and have the See Function button enabled. After sectioning off a certain area, the Flood tools will fill in your shape. Flood -> Value will fill outwards from where you click until it reaches the indicated value in the Drawing Value field. Flood -> Nonzero fill outwards from the click until it reaches a value other than zero. Flood-> Zero will fill out from the click until it reaches a zero value, and Zero -> Value will fill in zeros out from where you click until it reaches the value in the Drawing Value field. To fill in an area created by your Closed Curve tool, either Flood-> Value or Flood-> Zero will both work fine if you click within the created area. Once you are done drawing, click on Save, and you're done!