1 Program 3dproject

1.1 Purpose

Program 3dproject projects datasets along the three orthogonal directions to produce (up to) three 2D image files. Its options are to

- Project using the voxel sum, or using the voxel max along each ray.
- Edit out negative values.
- Project over the entire thickness of the dataset, or over any subrange (e.g., it is possible to get left hemisphere and right hemisphere projections separately).

Program 3dproject does not produce a brain outline or Talairach grid to provide any reference for projected images.

The output image files are by default in the internal *AFNI* format. This may not be useful for you, so you can either write them as 'normal sized' files with the -nsize option, or use program nsize (supplied with *AFNI*) to convert them later.

1.2 Usage

The command line format for program 3dproject is as follows:

3dproject [editing options][-sum|-max|-amax|-smax] [-output root] [-nsize] [-mirror] [-RL {all | x1 x2}] [-AP {all | y1 y2}] [-IS {all | z1 z2}] [-ALL] dataset

The options are explained below.

1.3 Options

-sum Add the dataset voxels along the projection direction.

-max Take the maximum of the voxels along the projection direction.

-amax Take the absolute maximum of the voxels along the projection direction.

-smax Take the signed maximum of the voxels along the projection direction.

For example:

Option	Voxel values	Projected value
-sum	-7, 2, 4, 5	4
-max	-7, 2, 4, 5	5
-amax	-7, 2, 4, 5	7
-smax	-7, 2, 4, 5	-7

Note: The default is -sum.

-nsize Scale the output images up to 'normal' sizes (e.g., 64x64, 128x128, or 256x256). This option only applies to byte or short datasets.

-mirror The radiologists' and AFNI convention is to display axial and coronal images with the subject's left on the right of the image; the use of this option will mirror the axial and coronal projections so that left is left and right is right.

-output root Output projections will be named root.sag, root.cor, and root.axi. The default root is 'proj'.

-RL all Project in the Right-to-Left direction along all the data (produces root.sag)

-RL x1 x2 Project in the Right-to-Left direction from x-coordinate x1 to x2 (mm) (negative x is Right, positive x is Left). Or, you may use something like -RL 10R 20L to project from x=-10 mm to x=+20 mm.

-AP all Project in the Anterior-to-Posterior direction along all the data (produces root.cor)

-AP y1 y2 Project in the Anterior-to-Posterior direction from y-coordinate y1 to y2 (mm) (negative y is Anterior, positive y is Posterior). Or, you may use something like -AP 10A 20P to project from y=-10 mm to y=+20 mm.

-IS all Project in the Inferior-to-Superior direction along all the data (produces root.axi)

-IS y1 y2 Project in the Inferior-to-Superior direction from z-coordinate z1 to z2 (mm) (negative z is Inferior, positive z is Superior). Or, you may use something like -IS 10I 20S to project from z=-10 mm to z=+20 mm.

-ALL ==> Equivalent to '-RL all -AP all -IS all'.

1.4 Notes

- A projection direction will not be used if the bounds aren't given for that direction; thus, at least one of -RL, -AP, or -IS must be used, or nothing will be computed!

- In the directions transverse to the projection direction, all the data is used; that is, '-RL -5 5' will produce a full sagittal image summed over a 10 mm slice, irrespective of the -IS or -AP extents.

- The [editing options] are the same as in 3dmerge. In particular, the '-1thtoin' option can be used to project the threshold data (if available).

1.5 Example

Example 1. The user wishes to project, over the entire thickness of the dataset, the *AFNI* 3D dataset anat+orig along the three orthogonal directions to produce three 2D image files. The command line is:

3dproject -ALL -output fred anat+orig

The resulting *AFNI* 2D datasets are: fred.axi, fred.cor, and fred.sag.