# SPM SurfRend Tutorial V0.2.1\_Release\_2005\_06\_14

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### FreeSurfer

FreeSurfer (CorTechs Labs, Inc., Charlestown, MA) is a set of semi-automated tools for reconstruction of the brain's cortical surface and overlay of function data onto the reconstructed surface (see also NeuroLens). Information on how to obtain a license and download the software is available at <a href="http://surfer.nmr.mgh.harvard.edu/">http://surfer.nmr.mgh.harvard.edu/</a>.

#### Neurolens

NeuroLens (written by Dr. Rick Hoge) is an integrated environment for the analysis and visualization of functional neuroimages. It is intended to provide extremely fast and flexible image processing, via an intuitive user interface that encourages experimentation with analysis parameters and detailed inspection of both raw image data and processing results using a consistent visualization environment. NeuroLens runs on Apple computers based on the PowerPC G4/G5 and Intel chipsets and running Mac OS X 10.3 (Panther) or later. It is available free for academic and non-profit research use. More information can be obtained at <u>http://www.neurolens.org/</u>.

## Generate SPM Overlay

		000	🔣 SPM2 (kahn)	
1.1 Start SPM		Control one-processing Brat <u>on</u>	Sice trains	Brotth
1.2 Choose the "Toolboxes" pull-dow	n menu	Coregister	Normalize	Degment
1		el altri genult te bas di centres	der ei Groß Gon	]
1.3 Choose the "surfrend" button		Basic models	1MBI	Raview design
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	Toolboxes		57na io Causel Moceli	nz 🛛
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1.4 Select the appropriate option from t	he pull-down menu in	000	🔀 SPM2 (kah	n): surfrend
the interactive		Create w-file overl Create w-file overl		

1.5 If you selected the "FreeSurfer custom surface", you will be prompted for the subject name.

1.6 Enter a name for the w-file overlay. The name needs to contain enough information so you'll be able to identify it

1.7 Choose between SPM results and the analyze format. The SPM button will call the "Results" (i.e., spm\_ getSPM) function in SPM. The "Analyze" button will allow you to load the analyze image of the contrast.

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surfrend			
W-Eile (ren	dered surface) output name:	exp1_all-baseline	

000	🔀 SPM2 (kahn): surfrend		
surfrend			
W-File (rend	ered surface) output name:	exp1_a	ll-baseline
	Image Format	SPM	Analyze

1.8.1 Choosing the Analyze button will prompt you for an image file. You will need to set a threshold (e.g., in spmT\*img file, the threshold corresponds to a T value).

SPM for fu	inctional MRI	000	X SPM2 (kahn): SPMget
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○ ○ ○	ahn): surfrend		12-con_0002.img 14-con_0002.img
surfrend			15-con_0002.img 16-con_0002.img
W-File (rendered surface) output na	me: exp1_all-baseline	1	18-con_0002.img 19-con_0002.img
Image For	mat Analyze		23-con_0002.img 24-con_0002.img
			26-con_0002.img RPV.img
			ResMS.img beta_0001.img
000	🔀 SPM2 (kahn): surfrer	nd	con_0002.img
surfrend			con_0003.img mask.img 1 :spmT_0002.img
W-File (rend	lered surface) output name:	exp1_all-baseline	spmT_0003.img
	Image Format	Analyze	Selected 1/1 file, press "Done" when finished.
	Threshold:	04	

1.8.2 Choosing the SPM button will prompt you for an SPM.mat file. Then you will be required to set the parameters similar to what you would have been asked were you to press the "Results" button in the SPM control panel.

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W-File (rendered :	surface) output name:	exp1_	all-baseline
	Image Format		SPM

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/tmp/dataS	ample_SPM2		
SubDirecto	pries		home
Filter	*SPM.mat	All Edit Ko	eybd Reset Done
		SPM.mat	

1.9 A progress bar will be shown for each hemisphere separately on the SPM interactive window. The Matlab command window will display the filenames of the overlays.

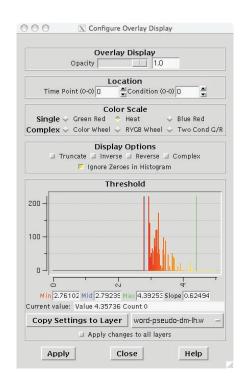
000		MATLAB	
	~ 🕅 🖬 🖌	/tmp/dataSample_SPM2	P 🛛 🖻
Shortcuts 🖪 How to Add	🖪 What's New		
3733	Statistical Para SPM2 - http://ww	metric Mapping w.fil.ion.ucl.ac.uk/spm	
Initialising SPM SPM present working d: /tmp/dataSamp	irectory:		
SPM2: spm_surfrend (v	0.2.1)	20:31:16 - 27/06/2005	
Left Hemisphere: Compu Saving rendered surface		-> surface trasnformation _all-baseline-lh.w	
Right Hemisphere: Comp Saving rendered surface >>		-> surface trasnformation _all-baseline-rh.w	

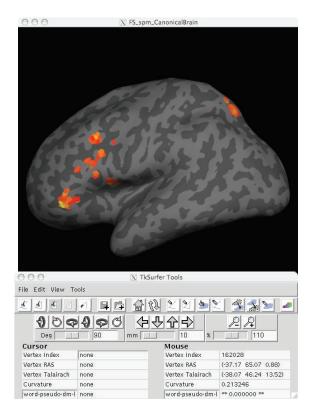
### Render SurfRend Overlay

### 2. FreeSurfer

Surfer	C C C C C C C C C C C C C C C C C C C
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2.1 In the TkSurfer Tools window select "Load Overlay"	surface: inflated 🛓 patch:
2.2 Select the w-file. Registration file is not	<u>V</u> OLUME 3D images: $\diamond$ orig $\diamond$ T1 $\diamond$ brain $\diamond$ wm $\diamond$ filled T1
required.	QuitSURFA Surface: 🛇 folded 🔹 inflated 💠 viewcuts 💠 flattened
X TkSurf	er Tools
File Edit View Tools	
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Load Surface Configuration	
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Load Time Course	Vertex Talairach (-46.71 -2.95 rain/fmri/FREQ_TMS/word-pseudo-dm-lh.w Browse
Load Group Descriptor File	Curvature 0.109258 Values file (.w), binary volume file (.bfloat/.bshort/.hdr), CORinfo file, or
Curvature	Use Registration:
Patch	
Label	Optional register.dat file. Leave blank for .v files or to use register.dat in
Field Sign	directory as volume
Field Mask	Field: Overlay Layer 1 (empty) -
Quit	The layer into which to load the values
	OK Cancel

2.3 Adjust overlay threshold by opening the configure overlay window (View -> Configure... -> Overlay...)



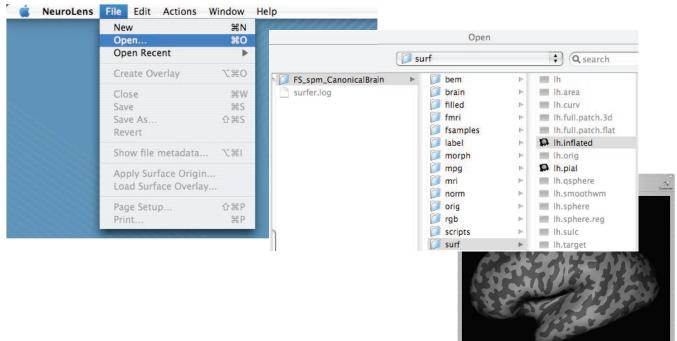


2.4 Alternatively, the surface and overlay can be opened from the command line:

qsurfer -subject FS\_spm\_CanonicalBrain -hemi lh -surf inflated -stat word-pseudo-dm

#### 3. NeuroLens

3.1 Open a surface file by selecting Open... in the File menu.



3.2 Load an overlay (w-file) by selecting Load Surface Overlay... in the File menu.

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3.3 Adjust overlay threshold by opening the inspector panel



