

DPABISurf: A Surface-Based Resting-State fMRI Data Analysis Toolbox

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Apply & Restart	-	VNC Viewer with DPABISurf Docker
Ocker Engine is running		
	-	0



Install Docker	
Set User/Memory	
Pull DP4BISurf Docker	
Get Freesurfer license	

Linux: sudo groupadd docker sudo usermod -aG docker \$USER

	Install Docker
	Pull Docker
Do	you want to pull from online docker hub or load from a local file? Pull from online docker hub Load from a local file
	Get Freesurfer license

Install Docker	
Set User/Memory	
Pull DPABISurf Docker	
Get Freesurfer license	

Please get Freesurfer license, and specify the license.txt you received in your email. Please visit: https://surfer.nmr.mgh.harvard.edu/registration

	PABISUIT DPABI Surf
	Instal
DPAE	3ISurf Pipeline
Temporal	Dynamic Analysis
Sta	ndardization
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	Utilities
VNC Viewer a	vith DPABISurf Docker
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•••	DPABISurf_Pipeline
DP	ABISurf Pipeline
Working Directory: A	Chern/ycg:DropbowTTmARCninetTmAAtTmDHarDPARSF_Upd
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Head Motion model: Rigid-bod	ty 6 Derivative 12 O Friston 24 Head motion scrubbing regressors
Nuisance regressors (WM, CSF, G	Sibbel Other covariates 🗹 Add mean back
Smooth FWHM for Surfa	ace: 10 FWHM for Volume: (6 6 6)
ALFF+IALFF Band (Hd): 0	0.01 - 0.1 V Filter (Hz): 0.01 - 0.1 Soubbing
ReHo Surface Neighbors:	1 2 vertices Volume Cluster: 7 19 27 voxels
Surface File SurfLH Alterniyog/De	npbox11 Surfiller Altern/ycg/Dropbox11 🗹 Degree Centrality
Functional Connectivity	Extract RDI time courses Dafine RDI
Parallel Workers #: 0	Functional Sessions #: 1 Starting Directory Name: FunRise
Save	Load Out Run















ICA-AROMA



Pruim et al., 2015. Neuroimage







Three Spaces





Spatial Smoothing

Why should you smooth?

- Might Improve CNR/SNR
- Improve intersubject registration

How much smoothing?

- Blob-size
- Typically 5-20 mm FWHM
- · Surface smoothing more forgiving than volume-based

on Freesurfer Cours

Volume-based Smoothing



- 5 mm apart in 3D
- 25 mm apart on surface!
- · Kernel much larger
- · Averaging with other
- tissue types (WM, CSF) • Averaging with other functional areas

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Volume-based Smoothing



ReHo

Smooth

• Smoothing is averaging of "nearby" voxels

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2D ReHo

Zuo et al., 2013. Neuroimage





Zuo et al., 2013. Neuroimage

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Define ROI





ROI List

Surface (right)

+ Mask + Seed Series

Remove Clear All

ок

•••

ROI Type: Surface (left)

Left Surface Right Surface Volume

ROI order:

Load ROIs 🛛 Vitiple L... Save ROIs ROISignals_SurfLHSurfRHVolu_FunSurfWCF













DPABL_TDA_Surf DPABLTDA.Surf Temporal Dynamic Analysis (for DPABlsurf) Wolfy Beating Denting Stratify Calify Telefore Stratify Calify Telefore Tele



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••• DPABI_TDA_Surf Based on DPARSF Temporal Dynamic Analysis (for DPABISurf) Preprocessed Data Starting D nizer_StandSurf_V2.1/Sta Window Setup TFR (s): 0 Volume Also Detrend **Dynamic Indices** Window Size: 30 Window Step: 1 Window Type: hamming 👩 🚺 Detrend If need filtering 19 🖸 27 1 to Surface Neighbors: 0 1 2 vertices Volume Cluster Surface File: SurfLH /U 4Tr ... SUR Degree Centrality r Threshold: 0.25 GSCorr Global Mask: /Users/yop/Dropbox/Tr nectivity Define ROI Vanuare Concentiance Smooth Conco Vase-vise Select Select Smooth C FWHM for Surface: 10 FWHM for Volume: (0.6.6) Parallel Workers # 0 Functional See Delete Dynamic 4D Files Quit Run



Based on DPABISurf Preprocessed Data

Starting Directory Name

> Participants TR

In addition to the surface-based data, also process the data in volume space processed by DPABISurf

monary producty	Starting Directory Name
Alsen/chao-ganyan/Downloads/DPAB_Organiz	e_StandSurf_V2.1/Sta PunSurfWC
fantopants	TR (A): 8
kerk Starf A S. Norm-Linkagi Ba Weden Star: 30 Window Bap: 1 Alf-ALFF Band (Ho): Barting Directory for Reish, Co.(Sin-Ho Sunface Neighbor: 1 Sunko Sunface Neighbor: 1 Sunko Austra Namuryog Dris Dagree Centrality Translatt GOSCOT Gastel Meak (Nerrity) Fundamin Connectivity Defres R	Ref. A. Contractularia There is a hototeching Webler Tare There is a hototeching Webler Tare There is a hototeching Con, FC is a ther thereis There is a hototeching Con, FC is a ther thereis There is a hototeching Con, FC is a there is a hototeching There is a hototeching Rota There is a hototeching Rota There is a hototeching
Salaulate Concordance Voxel-vise Voxel-vise Volume-vise	Smooth Concordance Smooth Concordance FWHM for Surface: 10 FWHM for Volume: (9.6.6) Sessions # 1 Delete Dynamic 4D Files





Standardization	•••	Standardization
across both hemispheres	Left Hemaphere Directory	aanto PANE (Openaer, Geordford VY, 10km Werdfordd 11, A.F.F. Furdiorfd galaar
Set data for both left hemisphere and right hemisphere Masks for both hemispheres	- Flight Hamisphere Directory Characterize paragraphic Control	Renner Att Impe
Standardization	Gutsut	Ramove Add Image Add Directory
methods	LH Mask ana/DPA	NEUGEnub ONELONAEIGurl Gurl empiates/havesge6_h_contex.label.gi
6	RH Mask uns/DPA	1981/Github/DPABI/DPABI/Surt/Surf/Tempiates/Saverage6_th_contex.label.gi
Space: Isaverage	Methods Z - St	Blandardization 😨 Bpace fisewraged
(anatomical) or		







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0	PALM Setting	
Number of permutations	5000	
Cluster inference	Cluster forming threshold (Z)	2.3
TFCE	FDR 🗸 Two tailed	
Acceleration method	No acceleration (few permutations)	0
Acceleration method or Surface Stats Surface File	No acceleration (few permutations)	
Acceleration method or Surface Stats Surface File Surface Area File	No acceleration (few permutations)	

{DPABI}/DPABISurf/SurfTemplates/fsaverage5_lh_white.surf.gii



Number of permutations	5000	
Cluster inference	Cluster forming threshold (Z)	2.3
TFCE	FDR 🗸 Two tailed	
Acceleration method	No acceleration (few permutations)	0
or Surface Stats Surface File		
Surface Area File		

 $Optional: \label{eq:constraint} Optional: \label{eq:constrai$









<complex-block>





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average5_Ih_HCP-MMP1.label.gii

Color & Border Show Border Utilities







DPABISurf VIEW





DPABISurf_VIEW



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DPABISurf	Use DPABISurf Docker		
	mri convert.bin subcort.mask.lmm.mgz freesurfer subcortical mask. 51d: mri convert.cv 1.226 2015/02/26 16:15:24 mreuter Exp § reading from subcort.mask.lmm.mgz TR=0.00, TE=0.00, TI=0.00, flip angle=0.00 1_ras = (-1, 0, 0)		
Install	j_ras = (0, 0, -1) k_ras = (0, 1, 0)		
• • VNC Viewer with DPABI Docker	<pre>writing to freesurfer_subcortical_mask_lmm.nii roota596ad169e63c:/ont/freesurfer/subjects/fraverage/mri#ls</pre>		
Please open a VNC viewer and connect to localhost.5925. The password is 'dipabi'. You can enjoy the GUI there. Tips: first input 'beath' to get if e easier.	T1.mgz orig aparc-aseg.mgz orig aparc.aseg.mgz p.aseg.mgz aparc.as005s-aseg.mgz rh.rjtbbo.mgz		
Statistical Analysis	brain.mgz subcort.mask.lmm.README		
Viewer	brainmask.mgz freesurfer_subcortical_mask_imm.nii_subcort.prob.log freesurfer_subcortical_prob_imm.nii_subcort.prob.mgz		
Utilities	transforms mni305.cor.mgz		
VNC Viewer with DPABISurf Docker	<pre>rootg506ad169e63c:/opt/freesurfer/subjects/fsaverage/mri# ls *.ni freesurfer_subcortical_mask_lmm.nii freesurfer_subcortical_prob rootB76ad18065c/ad56fsc </pre>		
The R-fMRI Maps Project	root@506ad169e63c:/opt/freesurfer/subjects/fsaverage/mil#_iiiv *.iii		
	Call DPABI StandAlone:		

/opt/DPABI/DPABI_StandAlone/run_DPABI_StandAlone.sh \${MCRPath} 74





Reading and Writing functions

Reading:

[Data, VoxelSize, FileList, Header] = y_ReadAll('XX.func.gii'); Data - 10242*230 single

Header - GIfTI Structure

Processing:

MeanData = mean(Data, 2);

Writing:

y_Write(MeanData , Header, 'MeanData.gii');

Further Help



Acknowledgments

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Michael P. Milham

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Further Help



DPABI特训营与DPABISurf加强营



第六届DPABI/DPARSF特训营 暨DPABISurf加强营通知 中国·北京 2019.10.26~10.28

定期举办,请关注http://rfmri.org

深度特训与数据分析

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- 思路设计 与国际知名专家讨论形成研究思路
- 论文撰写 系统的 SCI 论文写作训练

http://deepbrain.com



静息态功能磁共振成像深度数据分析

功能磁共振成像越来越成为一种主流的科研手段,然而功能磁共振的数据分 析却是一项具有高度挑战性的工作。海量的原始数据,繁多的分析步骤,复杂的 分析方法都让研究者们无所适从。恰当的分析方法可以从普通的数据中挖掘出富 有创新性的结果,而不适当的分析则可能让精心收集的数据黯然失色。深度大脑 公司联合 The R-fMRI Lab 的专业脑功能成像研究团队推出一站式功能磁共振数 据分析解决方案,助您从容应对功能磁共振数据带来的挑战。

DPABISurf工作站



http://deepbrain.com/DPABICore

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DPABI计算工作站

DPAB计算工作站 增式服务器 ews) 20核40建築時代生産4114 2.2G *2,9.6GT/s 2UPL,14M, Turbo, HT(85W), 4*16GE 82DMM, 64GPSP, 2666NT/5, 4*157,2K RPM,N55X, 16T時発金,元余电 第, RAID生: H330, DVD-RW 双电 三年級 http://deepbrain.com/DPABICore



DPABISurf 并行计算:



The R-fMRI Lab



Section 2017 WeChat Official Account: RFMRILab

Acknowledgments



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Thanks for your attention!