



The R-fMRI Maps Project

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<http://rfmri.org>

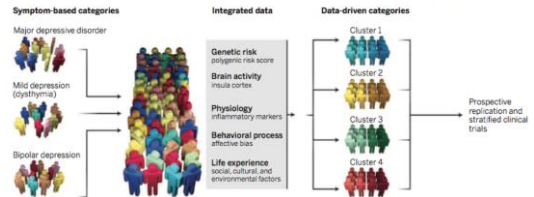
Institute of Psychology, Chinese Academy of Sciences

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The R-fMRI Maps Project

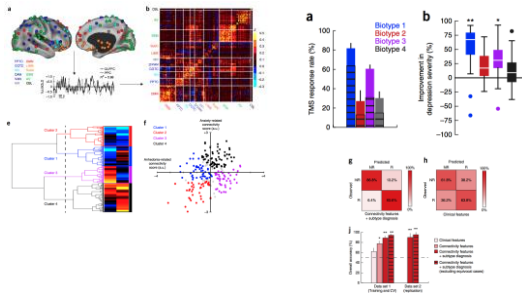
Deconstructed, parsed, and diagnosed.

A hypothetical example illustrates how precision medicine might deconstruct traditional symptom-based categories. Patients with a range of mood disorders are studied across several analytical platforms to parse current heterogeneous syndromes into homogenous clusters.



Insel and Cuthbert 2015, Science

Biotypes in Depression



Drysdale et al., 2016. Nat Med

The R-fMRI Maps Project



The R-fMRI Maps Project



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The R-fMRI Maps Project

已共享4770名被试数据，包括：

1. Amplitude of low frequency fluctuations (ALFF)
2. Fractional ALFF (fALFF)
3. Regional Homogeneity (ReHo)
4. Voxel-mirrored homotopic connectivity (VMHC)
5. Degree Centrality (DC)
6. 功能连接矩阵

- a. Automated Anatomical Labeling (AAL) atlas
- b. Harvard-Oxford atlas
- c. Craddock's clustering 200 ROIs
- d. Zalesky's random parcellations
- e. Dosenbach's 160 functional ROIs

此外，也共享灰质(GM)、白质(WM)和脑脊液(CSF)密度与体积图像。

The R-fMRI Maps Project (Continued)

Year	Study	Sample Size	Location	Country
2010	Study 1	100	Beijing	China
2011	Study 2	200	Shanghai	China
2012	Study 3	300	Guangzhou	China
2013	Study 4	400	Chengdu	China
2014	Study 5	500	Xi'an	China
2015	Study 6	600	Wuhan	China
2016	Study 7	700	Nanjing	China
2017	Study 8	800	Harbin	China
2018	Study 9	900	Qingdao	China
2019	Study 10	1000	Shenzhen	China
2020	Study 11	1100	Hangzhou	China
2021	Study 12	1200	Chongqing	China
2022	Study 13	1300	Shenzhen	China
2023	Study 14	1400	Guangzhou	China
2024	Study 15	1500	Shanghai	China
2025	Study 16	1600	Beijing	China
2026	Study 17	1700	Shenzhen	China
2027	Study 18	1800	Guangzhou	China
2028	Study 19	1900	Shanghai	China
2029	Study 20	2000	Beijing	China
2030	Study 21	2100	Shenzhen	China
2031	Study 22	2200	Guangzhou	China
2032	Study 23	2300	Shanghai	China
2033	Study 24	2400	Beijing	China
2034	Study 25	2500	Shenzhen	China
2035	Study 26	2600	Guangzhou	China
2036	Study 27	2700	Shanghai	China
2037	Study 28	2800	Beijing	China
2038	Study 29	2900	Shenzhen	China
2039	Study 30	3000	Guangzhou	China
2040	Study 31	3100	Shanghai	China
2041	Study 32	3200	Beijing	China
2042	Study 33	3300	Shenzhen	China
2043	Study 34	3400	Guangzhou	China
2044	Study 35	3500	Shanghai	China
2045	Study 36	3600	Beijing	China
2046	Study 37	3700	Shenzhen	China
2047	Study 38	3800	Guangzhou	China
2048	Study 39	3900	Shanghai	China
2049	Study 40	4000	Beijing	China
2050	Study 41	4100	Shenzhen	China
2051	Study 42	4200	Guangzhou	China
2052	Study 43	4300	Shanghai	China
2053	Study 44	4400	Beijing	China
2054	Study 45	4500	Shenzhen	China
2055	Study 46	4600	Guangzhou	China
2056	Study 47	4700	Shanghai	China
2057	Study 48	4800	Beijing	China
2058	Study 49	4900	Shenzhen	China
2059	Study 50	5000	Guangzhou	China
2060	Study 51	5100	Shanghai	China
2061	Study 52	5200	Beijing	China
2062	Study 53	5300	Shenzhen	China
2063	Study 54	5400	Guangzhou	China
2064	Study 55	5500	Shanghai	China
2065	Study 56	5600	Beijing	China
2066	Study 57	5700	Shenzhen	China
2067	Study 58	5800	Guangzhou	China
2068	Study 59	5900	Shanghai	China
2069	Study 60	6000	Beijing	China
2070	Study 61	6100	Shenzhen	China
2071	Study 62	6200	Guangzhou	China
2072	Study 63	6300	Shanghai	China
2073	Study 64	6400	Beijing	China
2074	Study 65	6500	Shenzhen	China
2075	Study 66	6600	Guangzhou	China
2076	Study 67	6700	Shanghai	China
2077	Study 68	6800	Beijing	China
2078	Study 69	6900	Shenzhen	China
2079	Study 70	7000	Guangzhou	China
2080	Study 71	7100	Shanghai	China
2081	Study 72	7200	Beijing	China
2082	Study 73	7300	Shenzhen	China
2083	Study 74	7400	Guangzhou	China
2084	Study 75	7500	Shanghai	China
2085	Study 76	7600	Beijing	China
2086	Study 77	7700	Shenzhen	China
2087	Study 78	7800	Guangzhou	China
2088	Study 79	7900	Shanghai	China
2089	Study 80	8000	Beijing	China
2090	Study 81	8100	Shenzhen	China
2091	Study 82	8200	Guangzhou	China
2092	Study 83	8300	Shanghai	China
2093	Study 84	8400	Beijing	China
2094	Study 85	8500	Shenzhen	China
2095	Study 86	8600	Guangzhou	China
2096	Study 87	8700	Shanghai	China
2097	Study 88	8800	Beijing	China
2098	Study 89	8900	Shenzhen	China
2099	Study 90	9000	Guangzhou	China
2100	Study 91	9100	Shanghai	China
2101	Study 92	9200	Beijing	China
2102	Study 93	9300	Shenzhen	China
2103	Study 94	9400	Guangzhou	China
2104	Study 95	9500	Shanghai	China
2105	Study 96	9600	Beijing	China
2106	Study 97	9700	Shenzhen	China
2107	Study 98	9800	Guangzhou	China
2108	Study 99	9900	Shanghai	China
2109	Study 100	10000	Beijing	China

已有593名研究者下载

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Outline

- Data Preparation
- Standardized Preprocessing
- Quality Control
- Data Upload

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Data Organization

ProcessingDemoData.zip

FunRaw

Sub_001
Sub_002
Sub_003

Functional DICOM data

T1Raw

Sub_001
Sub_002
Sub_003

Structural DICOM data

<http://rfmri.org/DemoData>

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Data Organization

ProcessingDemoData.zip

FunImg

Sub_001
Sub_002
Sub_003

Functional NifTI data
(.nii.gz, .nii or
.img)

T1Img

Sub_001
Sub_002
Sub_003

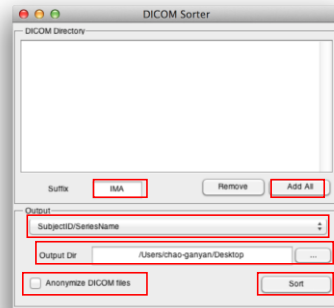
Structural NifTI data
(.nii.gz, .nii or
.img)

8



9

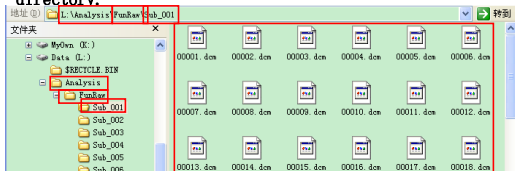
IMA
dcm
none



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Data preparation

Arrange each subject's fMRI DICOM images in one directory, and then put them in "FunRaw" directory under the working directory.

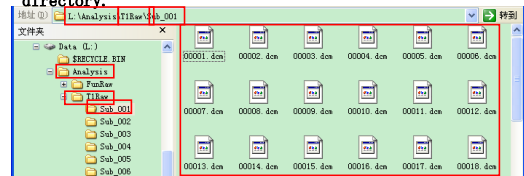


Subjects' DICOM files directory, please name as this
Working directory

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Data preparation

Arrange each subject's T1 DICOM images in one directory, and then put them in "T1Raw" directory under the working directory.



Subjects' DICOM files directory, please name as this
Working directory

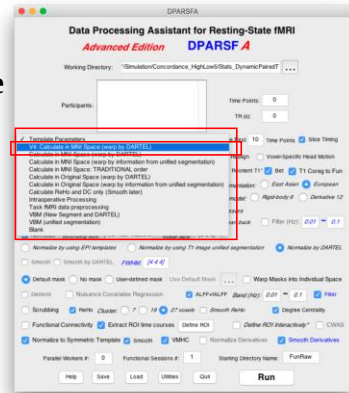
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Outline

- Data Preparation
- ➡ • Standardized Preprocessing
- Quality Control
- Data Upload

Resting State fMRI Data Processing

Template Parameters



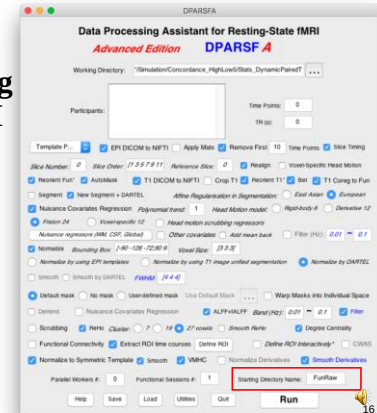
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Preprocessing and R-fMRI measures Calculation



Preprocessing and R-fMRI measures Calculation



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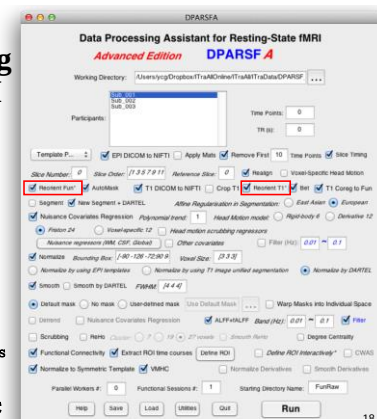
16

Outline

- Data Preparation
- Standardized Preprocessing
- ➡ • Quality Control
- Data Upload

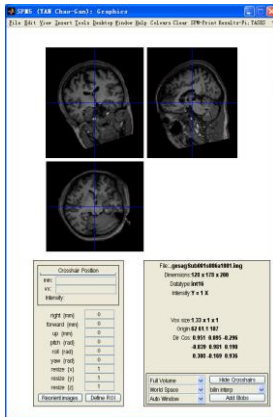
Preprocessing and R-fMRI measures Calculation

Reorient Interactively
This step could improve the accuracy in coregistration, segmentation and normalization, especially when images had a bad initial orientation.
Also can take as a QC step



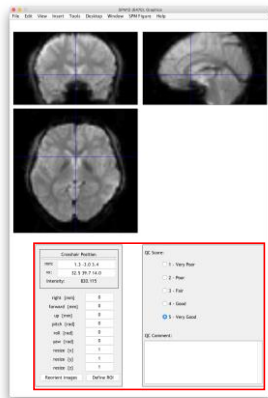
17

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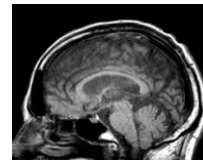


Display the mean image after realignment. (Could take this step as a QC procedure.)

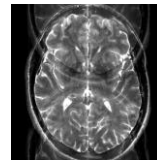
QC scores and comments are stored at {WorkDir}/QC



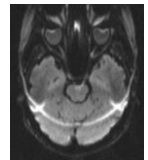
21



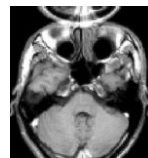
Motion artifact



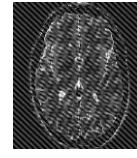
Ghost



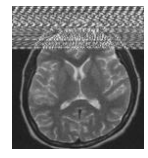
Chemical shift artifacts



Aliasing artifacts

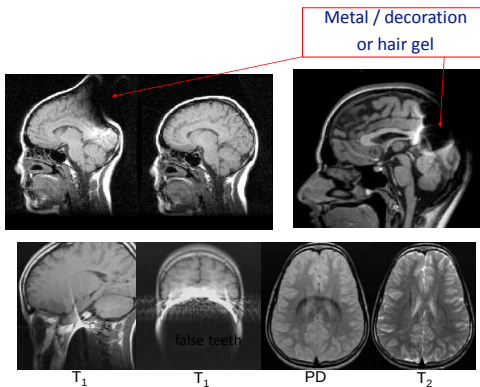


Spikes (single peak in k-space)



Zipper

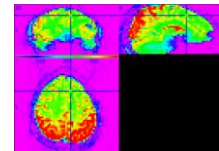
Courtesy of Dr. Rui-Wang Huang



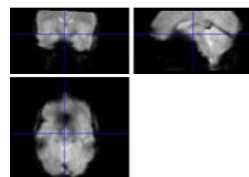
Courtesy of Dr. Rui-Wang Huang



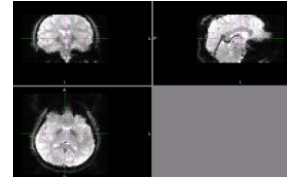
Ghost



Inhomogeneity



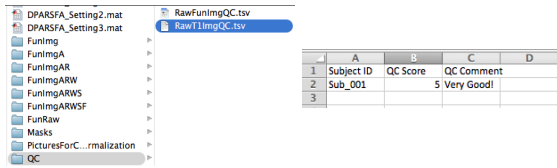
Bad coverage



Not good coverage

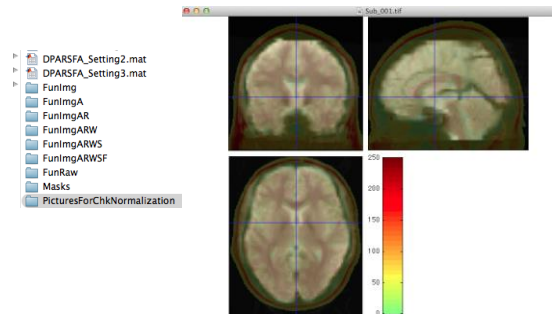
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Quality Control

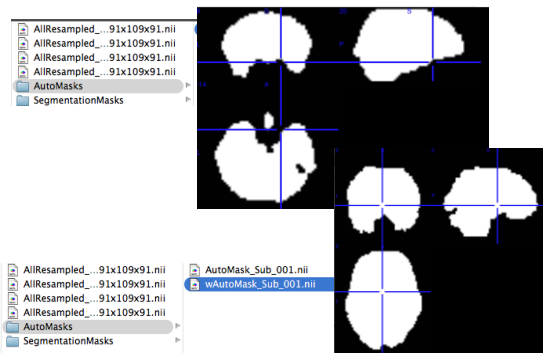


	A	B	C	D
1	Subject ID	QC Score	QC Comment	
2	Sub_001		5 Very Good!	
3				

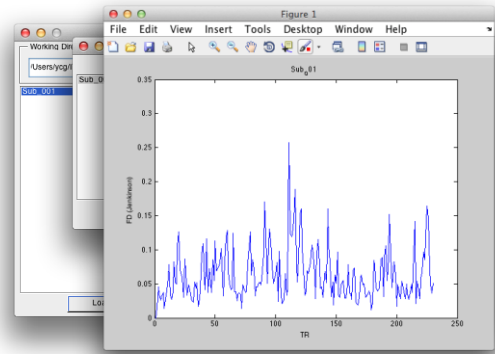
Quality Control



Quality Control

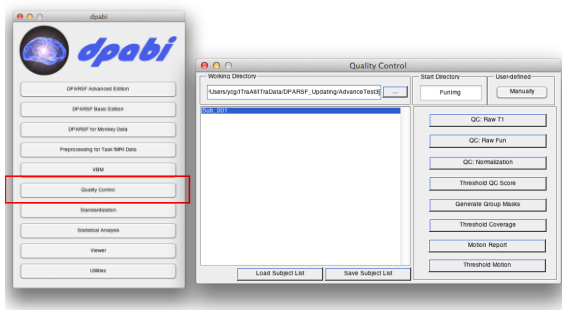


Quality Control



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Quality Control

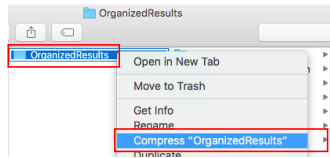


Outline

- Data Preparation
- Standardized Preprocessing
- Quality Control
- ➔ • Data Upload

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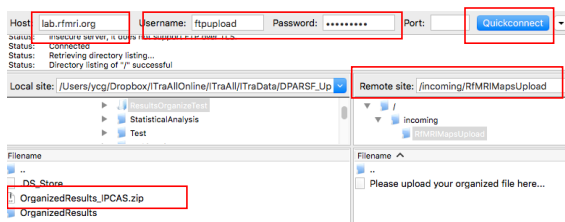
Data Upload



Data Upload

1. FTP: lab.rfmri.org; username: ftpupload; password: FTPUpload. E.g., FileZilla

Data Upload



Data Upload

1. FTP: lab.rfmri.org; username: ftpupload; password: FTPUpload. E.g., FileZilla
2. 网盘
3. QQ邮箱超大附件

Send an email to rfmriab@gmail.com to let us know, together with the phenotypic table.

Further Help



<http://rfmri.org/Course>



<http://rfmri.org/wiki>



The R-fMRI Journal Club



Official Account: RFMRILab

DPABI特训营与DPABISurf加强营



第六届DPABI/DPARF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



静态功能磁共振成像数据深度特训

从您见到这条消息开始，您便将有机会与 The R-fMRI Lab 的静态功能磁共振专家团队合作探索大脑的奥秘！深度进阶特训期间，您将亲身体验：

- 数据处理 专家指导下高效学习静态功能磁共振成像数据处理
- 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，而不恰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 的专业功能磁共振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

DPABI工作站

序号	名称	参数	市场指导价
1.	DPABISurf工作站 (Windows)	14核16线程专业级服务器小机箱工作站版 4个CPU (4核/16线程) 4x20GB, 16GB内存, 256GB固态硬盘+1TB机械硬盘, PCIe, 独立显卡, 售后培训	¥9999
2.	DPABISurf工作站 (Linux/Windows)	模式服务器 200840服务器级服务器机箱114.2 ZJG 2x 8核/16线程 2x 20GB Turbo, 16GB内存, 256GB固态硬盘+1TB机械硬盘, PCIe, 独立显卡, 售后培训	¥59999
3.	DPABISurf工作站 (Windows)	15.6英寸移动图形工作站 4个CPU (4核/16线程) 4x20GB, 16GB内存, 256GB固态硬盘+1TB机械硬盘, PCIe, 独立显卡, 售后培训	¥24999

4.	DPABISurf工作站 (Mac)	14核16线程专业级服务器小机箱工作站版 4个CPU (4核/16线程) 4x20GB, 16GB内存, 256GB固态硬盘+1TB机械硬盘, PCIe, 独立显卡, 售后培训	¥94999
5.	DPABISurf工作站 (Mac)	15.6英寸移动图形工作站 4个CPU (4核/16线程) 4x20GB, 16GB内存, 256GB固态硬盘+1TB机械硬盘, PCIe, 独立显卡, 售后培训	¥51999
6.	DPABISurf工作站	15.6英寸移动图形工作站 4个CPU (4核/16线程) 4x20GB, 16GB内存, 256GB固态硬盘+1TB机械硬盘, PCIe, 独立显卡, 售后培训	¥24999

<http://deepbrain.com/DPABICore>

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DPABI计算工作站

2.	DPABI计算工作站 (Linux/Windows)	200840服务器级服务器机箱114.2 ZJG 2x 8核/16线程 2x 20GB Turbo, 16GB内存, 256GB固态硬盘+1TB机械硬盘, PCIe, 独立显卡, 售后培训	¥59999
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<http://deepbrain.com/DPABICore>



DPABISurf 并行计算:

每天完成 **20** 个被试的皮层计算!!!

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The R-fMRI Lab



WeChat Official Account: RFMRILab

Acknowledgments



Chinese Academy of Sciences
Xi-Nian Zuo
Hangzhou Normal University
Yu-Feng Zang
NYU Child Study Center
F. Xavier Castellanos
Child Mind Institute
Michael P. Milham

- National Natural Science Foundation of China
- National Key R&D Program of China
- Chinese Academy of Sciences

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Thanks for your attention!

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