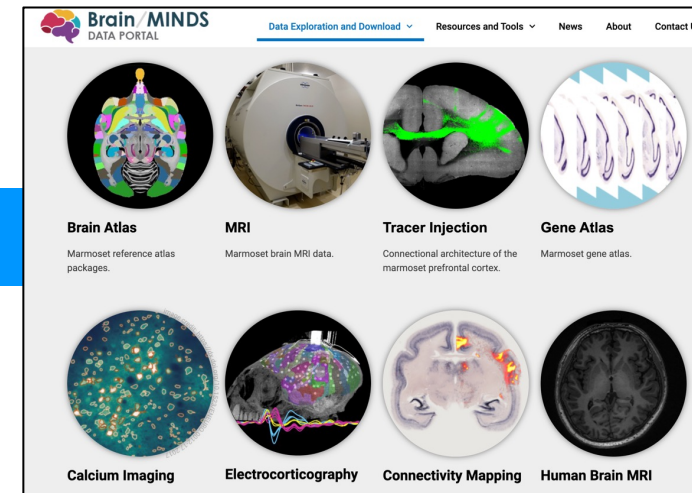
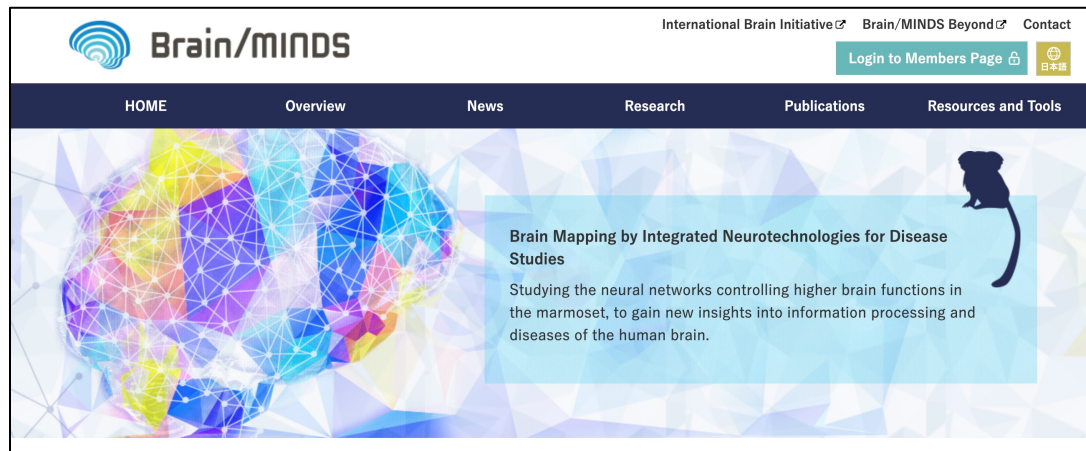


Data collection and sharing in Brain/MINDS Beyond human brain MRI project

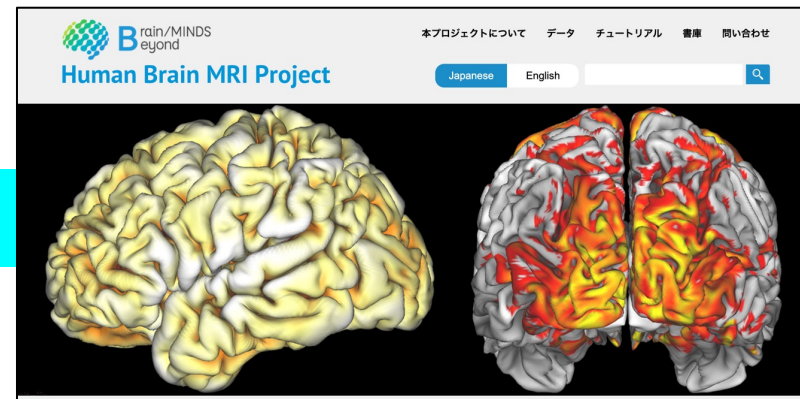
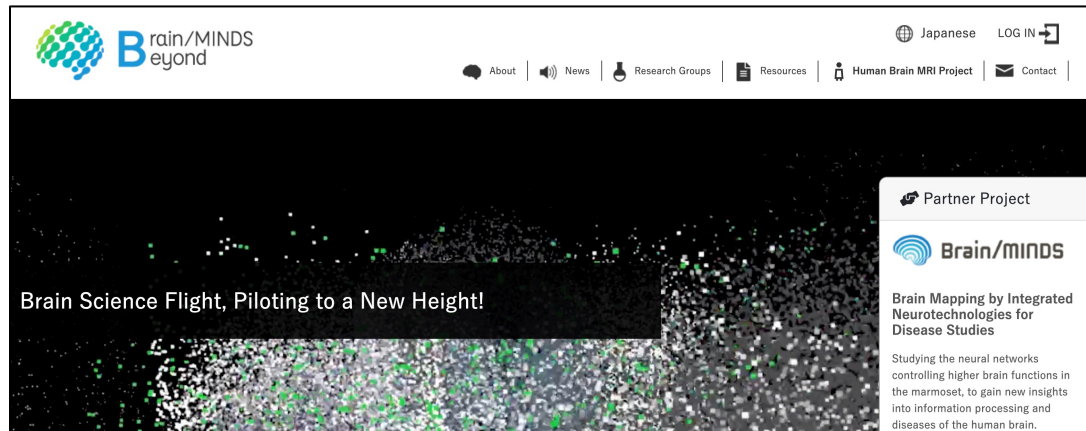
Saori C. Tanaka
Brain/MINDS Beyond / ATR, Japan

Brain/MINDS (FY2014-)



Marmoset
Human

Brain/MINDS Beyond (FY2018-)



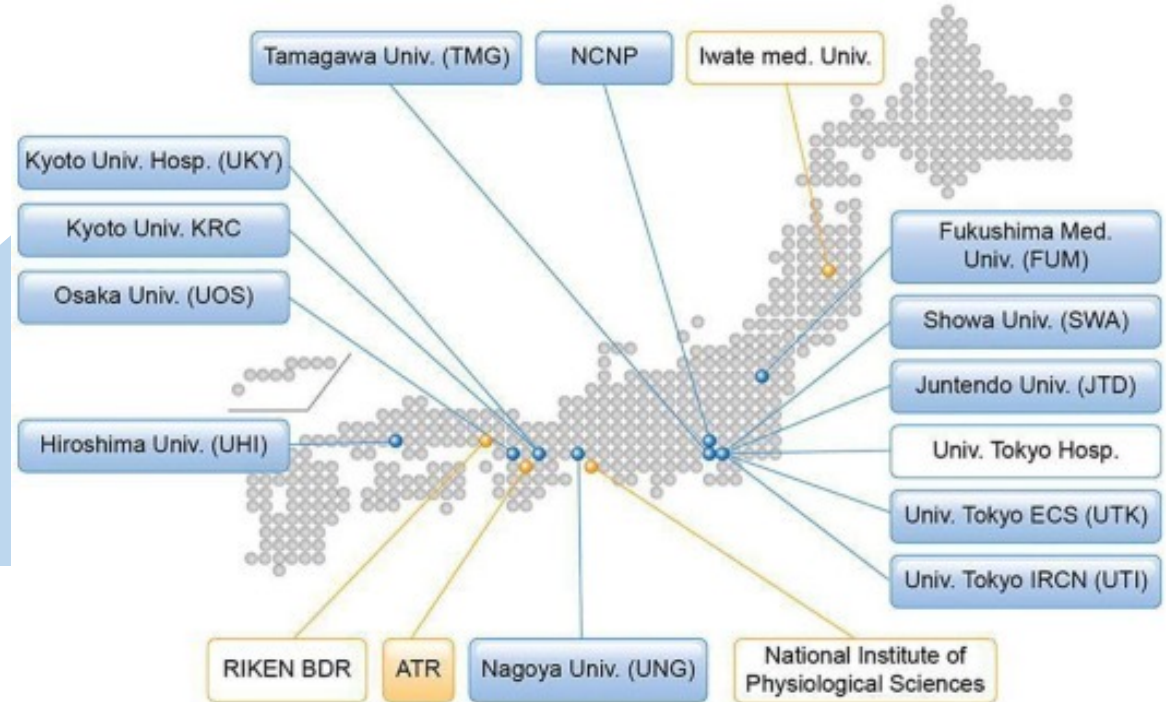
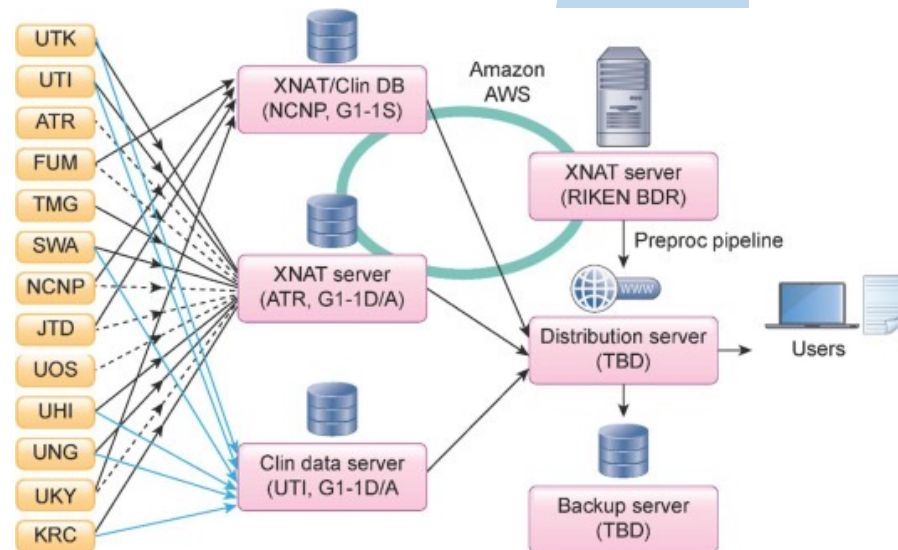
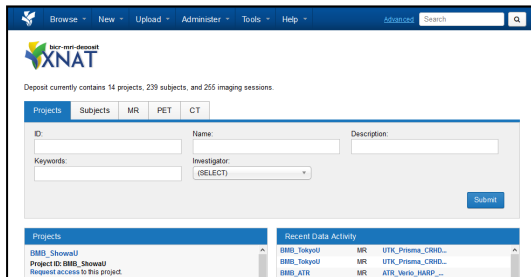
Human
Macaca
Marmoset

Brain/MINDS Beyond human brain MRI project

- The project collect **multi-site** brain MRI data of patients with psychiatry and neurological disorders and healthy controls
- We will start to release the **quality-controlled** datasets from more than **7,000** participants from 2024

AIM: Revealing human intelligence, sensitivity and sociality at brain circuit level for the early detection and intervention of psychiatric and neurological disorders

XNAT

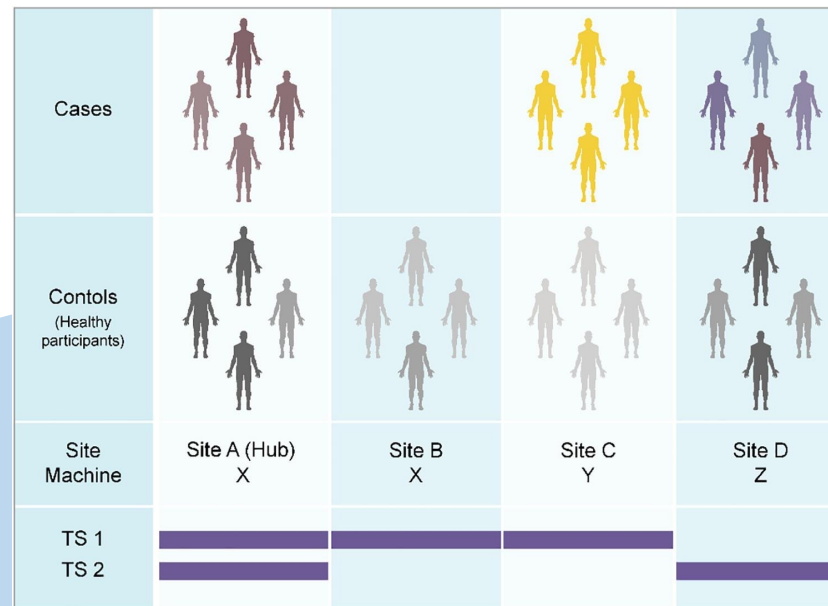


(Koike et al., 2021, *Neuroimage: Clinical*)



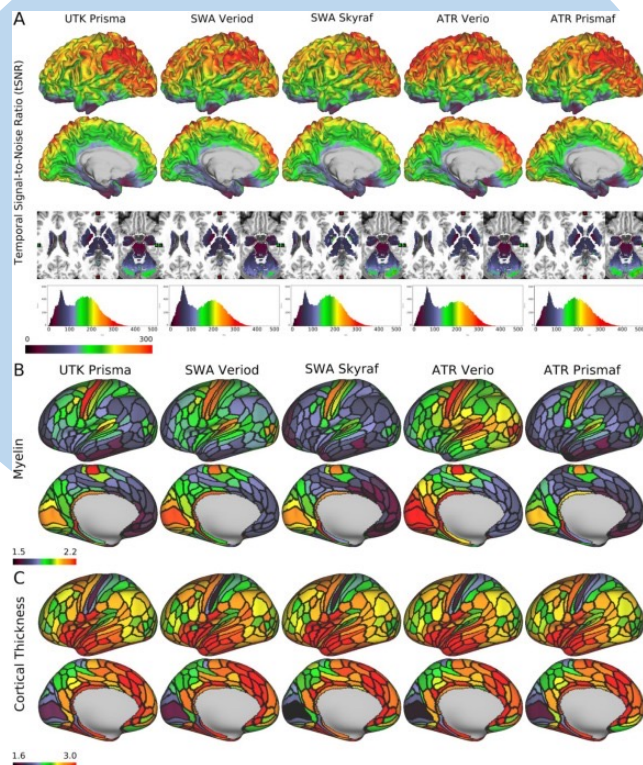
Harmonization of multi-site data

- **Prospective harmonization:** developed a unified imaging protocol acceptable in the clinical sites with finer resolution
- **Statistical harmonization:** designed and performed the traveling subject (each participants was measured in the multiple sites)



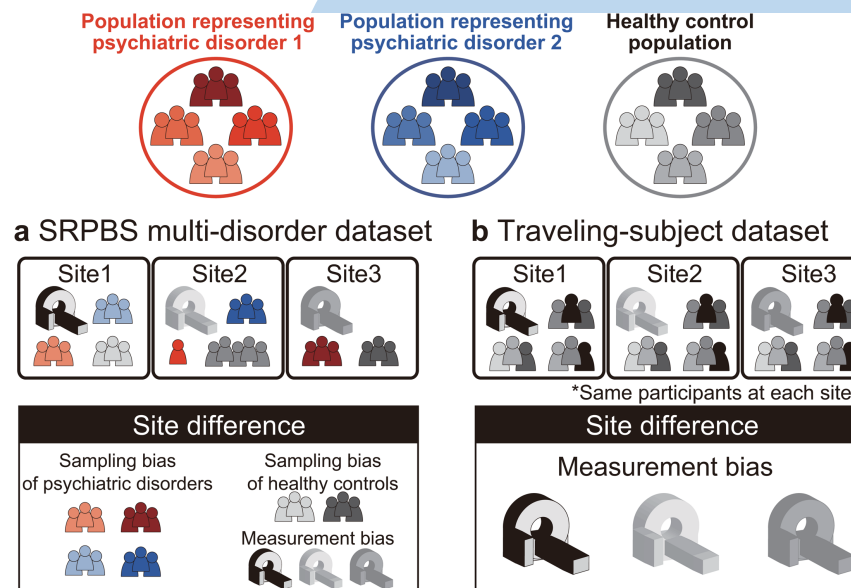
(Koike et al., 2021, *Neuroimage: Clinical*)

Prospective harmonization



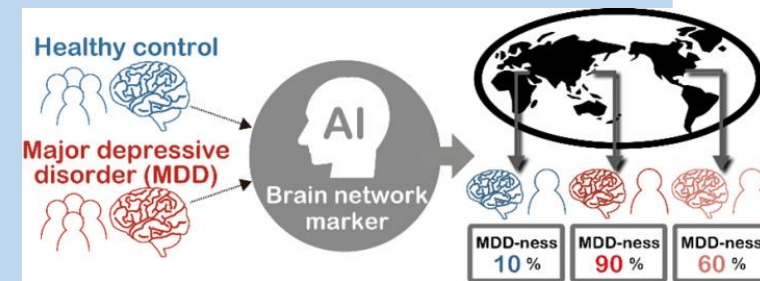
(Koike et al., 2021, *Neuroimage: Clinical*)

Statistical harmonization



(Yamashita et al., 2019, *PLOS Biology*)

We developed a robust biomarker using resting state functional connectivity of major depression that can be generalized to the independent data.



(Yamashita et al., 2020, *PLOS Biology*)

Allow development of AI-based biomarkers with high generalization performance that can withstand clinical application

Actions for task forces of DSS WG

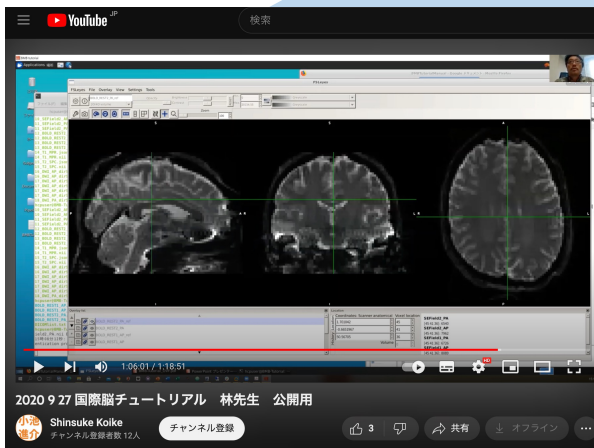
- Data Governance: Developed **web app** of data governance
- Data Catalog: **Fixed meta data** for data catalogue
- Training: Held training courses for **Quality Control** and data analysis

Web app of data governance

Meta data for catalogue

Variable Code	Sharing level	Category	Subcategory	Explanation	Var rule
XNAT_ID	Public	XNAT_data_info		MRI scan ID. It is generally one ID per c	string
consent	Public	Clinical		Consent to Data sharing	integer
gender	Public	XNAT_data_info		Sex at birth	string
age	Public	XNAT_data_info		Age at MRI scan	integer
diag_code	Public	Clinical	Demographic	**Coding for participants with unknown c	string
diag_dscrp	Public	Clinical	Demographic	diagnosis specification in words	string
diag_other	Public	Clinical	Demographic	other information about diagnosis (if ap	string
diag_comorb	Public	Clinical	Demographic	information about comorbid mental illne	string
diag_crit	Public	Clinical	Demographic	diagnostic criteria used for diagnosis	integer
diag_method	Public	Clinical	Demographic	method of diagnosis (structured interview	integer
diag_person	Public	Clinical	Demographic	person confirming diagnosis	integer
subtype	Public	Clinical	Demographic	information about disease subtype (if ap	string
handedness	Public	Clinical	Handedness	Handedness	string
handedness_date	Sharing, G1-2 management	Clinical	Handedness	Date administered.	date
handedness_version	Sharing, G1-2 management	Clinical	Handedness	version of Handedness administered (J	string
handedness_jsbp	Sharing, G1-2 management	Clinical	Handedness	score for handedness calculated by JSE	integer
handedness_ehi	Sharing, G1-2 management	Clinical	Handedness	score for handedness calculated by Edii	integer
handedness_other	Sharing, G1-2 management	Clinical	Handedness	handness calculated by other method	string
ses_self	Public	Clinical	SES	Participant's highest level of education	integer
ses_self_date	Sharing, G1-2 management	Clinical	SES	Date administered.	date
ses_parental	Public	Clinical	SES	Parent's highest level of education	integer
ses_parental_date	Sharing, G1-2 management	Clinical	SES	Date administered.	date
ses_moth	Sharing, G1-2 management	Clinical	SES	Mother's highest level of education	integer
ses_fath	Sharing, G1-2 management	Clinical	SES	Father's highest level of education	integer
edu_years	Public	Clinical	Demographic	Participant's level of education in years	integer
jart	Public	Clinical	Intellectual ab	estimated full scale IQ from JART	float
jart_date	Sharing, G1-2 management	Clinical	Intellectual ab	Date administered.	date
jart_version	Sharing, G1-2 management	Clinical	Intellectual ab	version of JART administered (25 items	string
jart_score	Sharing, G1-2 management	Clinical	Intellectual ab	JART score	integer
Sleepiness1	Public	XNAT_data_info		Stanford Sleepiness Score (SSS) after 1	integer
Sleepiness2	Public	XNAT_data_info		SSS after 2nd set	integer
Sleepiness3	Public	XNAT_data_info		SSS after 3rd set	integer
Sleepiness4	Public	XNAT_data_info		SSS after 4th set	integer
Sleepiness5	Public	XNAT_data_info		SSS after 5th set	integer
Sleepiness6	Public	XNAT_data_info		SSS after 6th set	integer

Training



All materials are available on the website and YouTube channel.

Home > BMB_TokyoU_TS

BMB_TokyoU_TS

プロジェクト: BMB_TokyoU_TS | 機関: 東京大学 (駒場) | データ数: 147件 (2022年4月)

MRI: Prisma | プロトコル: CRHD, HARP, SRPB

ダウンロード

Download data

No	プロジェクト	機関	MRI	プロトコル	バージョン	サイズ	詳細	履歴
1	BMB_TokyoU_TS	東京大学 (駒場)	Prisma	CRHD	ver1.0 (2020-07-31)	122.5GB	データ詳細	DL済
2	BMB_TokyoU_TS	東京大学 (駒場)	Prisma	HARP	ver1.0 (2020-07-31)	73.7GB	データ詳細	
3	BMB_TokyoU_TS	東京大学 (駒場)	Prisma	SRPB	ver1.0 (2020-07-31)	3.1GB	データ詳細	DL済

データステータス

CSVダウンロード | CSVアップロード

No	XNAT_ID	PROJECT	Data Check	Transfer	Pre-process	QCfile	ImageQC 1	ImageQC 2	ImageQC 3	ImageQC 4	NIFTI	BAQC	Note
1	UTK_Prisma_CRHD_9036_001	BMB_TokyoU_TS	■	■	■								
2	UTK_Prisma_CRHD_9036_002	BMB_TokyoU_TS	■	■	■								
3	UTK_Prisma_CRHD_9038_001	BMB_TokyoU_TS	■	■	■								
4	UTK_Prisma_CRHD_9038_002	BMB_TokyoU_TS	■	■	■								
5	UTK_Prisma_CRHD_9039_001	BMB_TokyoU_TS	■	■	■								
6	UTK_Prisma_CRHD_9039_002	BMB_TokyoU_TS	■	■	■								
7	UTK_Prisma_CRHD_9046_001	BMB_TokyoU_TS	■	■	■								

Refer to data status (ex. QC, pre-process)

Quickly check the current status of each data on the long process, including measurement, collection, transferring, QC, and preprocessing, performed by different members or institutes.

Public sharing of multi-disorders, multi-sites datasets

Valuable open dataset of patients and healthy individuals as well as traveling subjects

SRPBS Multidisorder MRI Dataset
The 3T MRI imaging data from 1627 participants collected at 12 sites.

DATA

The dataset contains the following files:

- (1) Brain imaging dataset (subjects="Y000001", Y1, Y2) (NIFTI format)
 - Resting state functional image
 - T1-weighted structural image
 - Functional parcellation
- (2) Metadata (README.txt)
 - Explanation of dataset
- (3) Participant demographic information (participants.txt)
 - Including ID, age, sex, hand, diagnosis, clinical rating scales
- (4) Supplemental demographic information for each site (sup.txt)
 - Including ID, age, sex, hand, diagnosis, additional clinical rating scales
- (5) MRI protocols (MRI_protocols_(y0001, Y1).txt)
- (6) Scanning parameters for rs-fMRI and T1w
- (7) QC results (qcmap_(Data, T1w).txt)
 - Outputs of MRQC for rs-fMRI and T1w
- (8) Evaluation of deface quality (deface_QC.txt)
 - Resting state of quality of defaced T1w

REFERENCE

Please refer to our published paper for detailed methods:
Taniike, S.G., Yamashita, A., Yokota, M. et al. A multi-site, multi-disorder resting-state magnetic resonance image database. Sci Data 8, 227 (2021). <https://doi.org/10.1038/s41598-021-01800-6>

DOWNLOAD

[DATA DOWNLOAD](#)

* ZIP file (1.2GB) [Download](#)
* ZIP file (1.2GB) [Download](#)
* ZIP file (1.2GB) [Download](#)

CODE

Program code of deface (face-masking) for anatomical MRI images
To avoid identifying individual participants by reconstruction of face surface from the structural MRI data of our datasets, we performed face-masking automatically. This code removes the subject's face from the MRI structure image (NIFTI format: .nii). This is written in MATLAB and directly uses SPM12 and nri_deface.

GitHub page: <https://github.com/brainiac-research/deface>

SRPBS
Synapse ID: syn22317076 Storage Location: gp/rdp/text/1600

Wiki Files Tables Discussion Docker

Decoded Neurofeedback Project within Strategic Research Program for Brain Sciences (SRPBS), BMI Technology Application of DecNeF for development of diagnostic and care system for mental disorders and construction of clinical application bases

Consortium

In 2018, around 40 neuroscientists, neuropsychiatrists, engineers, computational scientists, and psychologists from eight Japanese universities and institutes formed a consortium as part of the Japanese Strategic Research Program for the Promotion of Brain Science (SRPBS) for big data applications, machine-learning algorithms, and sophisticated fMRI neurofeedback methods for the diagnosis and treatment of multiple psychiatric disorders. Many of these techniques are related to brain-machine interfaces. SRPBS is a nation-wide research program for brain science supported by the Japanese Advanced Research and Development Programs for Medical Innovation (AMED). Here, we explain the consortium's organization, its data collection and sharing projects, its sophisticated neurofeedback projects, the construction of biomarkers for multiple psychiatric disorders, therapy based on sophisticated neurofeedback methods, and the biological dimensions of the spectrum of multiple disorders.

For more information, please go to DecNeF Project site: <https://bici.atr.jp/decnefpr/>

- Released the datasets from **1,600** participants and **9** TSs from **2020**
- Start to release the datasets from more than **7,000** participants and **80** TS from **2024**

	CRHD	HARP	SRPB	Total
Depression	206	1415	603	2224
Bipolar	80	285	17	382
ASD	86	90	0	176
ADHD	0	60	0	60
Schizophrenia	118	142	61	369
Dementia (Alzheimer)	0	335	0	335
PD	0	805	0	805
Eating Disorder	0	60	72	132
Epilepsy	10	0	0	10
MCI	20	0	0	20
ARMS	27	0	0	27
OCD	0	0	71	71
Anxiety Disorder	0	0	174	174
Chronic Pain	0	38	0	38
Healthy Participants	272	1671	664	2679
Total	819	4901	1662	7502

Contents of datasets

MRI data	Demographic information	Clinical information	Other
Anatomical MRI (T1w, T2w, DWI) Functional MRI (resting-state fMRI, task fMRI*) Fieldmap * Optional	Age, sex, handedness, diagnosis, criterion for diagnosis, education, JART25** **Japanese version of National Adult Reading Test	Symptom assessment scale (Name and total score)	Sleepiness scale in resting state fMRI

HARmonized Protocol for Brain/MINDS-beyond (HARP)

セット	サブセット	撮像名称	撮像時間	内容
必須	ロカイザー	AAHead_Scout	0:13-0:14	スカウト撮像、AC-PCの同定とFOVの自動設定
		AC-PC_setup	0:06	FOVの確認とシミング
	rfMRI 1回目	SEField1_AP	0:06	歪み補正用のスピネコーB0磁場画像(位相方向APとPA)、および1回目の安静時fMRI画像(AP, PA)。必ずセットで撮影すること。
		BOLD_REST1_AP	5:08	
		SEField1_PA	0:06	
	BOLD_REST1_PA	5:08		
	構造画像	T1_MPR	5:22	3D T1強調画像とT2強調画像。解剖画像用。必ずT1_MPR, T2_SPCとセットで撮影すること。
T2_SPC		5:31-6:26		

- Acceptable for Siemens and GE MRIs

オプション	ASL	ASL_ADNI (Prisma, SKkyra, Verio_VD13Aのみ)	2:45	動脈スピラベリングによる血流評価。ADNI版。
	QSM	QSM_3D (Prisma, Skyraのみ)	5:03	3D定量的磁化率マッピング。
	DWI	DWI_AP (Prismaはdir54, 非Prismaはdir68)	3:29-4:50	拡散強調画像。ひずみ補正のため13,14と必ずセットで撮影すること。
		DWI_PA (Prismaはdir55, 非Prismaはdir69)	3:32-4:54	
	rfMRI 2回目	SEField2_AP	0:06	歪み補正用のスピネコーB0磁場画像(位相方向APとPA)、および2回目の安静時fMRI画像(AP, PA)。必ずセットで撮影すること。
		BOLD_REST2_AP	5:08	
		SEField2_PA	0:06	
	BOLD_REST2_PA	5:08		
	rfMRI 3回目	SEField3_AP	0:06	歪み補正用のスピネコーB0磁場画像(位相方向APとPA)、および3回目の安静時fMRI画像(AP, PA)。必ずセットで撮影すること。
		BOLD_REST3_AP	5:08	
		SEField3_PA	0:06	
	BOLD_REST3_PA	5:08		
	tfMRI-EMOTION	SEField4_AP	0:06	歪み補正用のスピネコーB0磁場画像(位相方向APとPA)、および課題fMRI(EMOTION)。必ずセットで撮影すること。
		SEField4_PA	0:06	
		BOLD_EMOTION_PA	4:08	
	tfMRI-CARIT	SEField5_AP	0:06	歪み補正用のスピネコーB0磁場画像(位相方向APとPA)、および課題fMRI(CARIT)。必ずセットで撮影すること。
		SEField5_PA	0:06	
BOLD_CARIT_PA		4:08		