

Data ingestion

Inputs

FreeSurfer surfaces (.pial/.white)

FreeSurfer morphometry (.thickness)

GIftI (.surf/.func/.shape.gii)

NIfTI / MGZ volumes & labels

HippUnfold v1 / v2 (den-8k)

TractSeg bundle masks

meshes (.ply/.obj/.stl/.vtk) · HDF5

point clouds (N×3)

Loaders & discovery

single-file

```
load()  
load_mesh() · load_nifti()  
load_gifti_*( )  
load_freesurfer_*( )  
load_hdf5()
```

cohort

```
discover_bids()  
discover_freesurfer()  
discover_tractseg_*( )  
load_group()  
resample_to_template()
```

volume → surface

```
marching cubes  
(scikit-image)  
ROI / label select
```

Data model

BrainMesh (V, F)

BrainPointCloud (P)

**GroupData
stacked cohort
+ covariates**

**decompose()
LBO eigenpairs**

