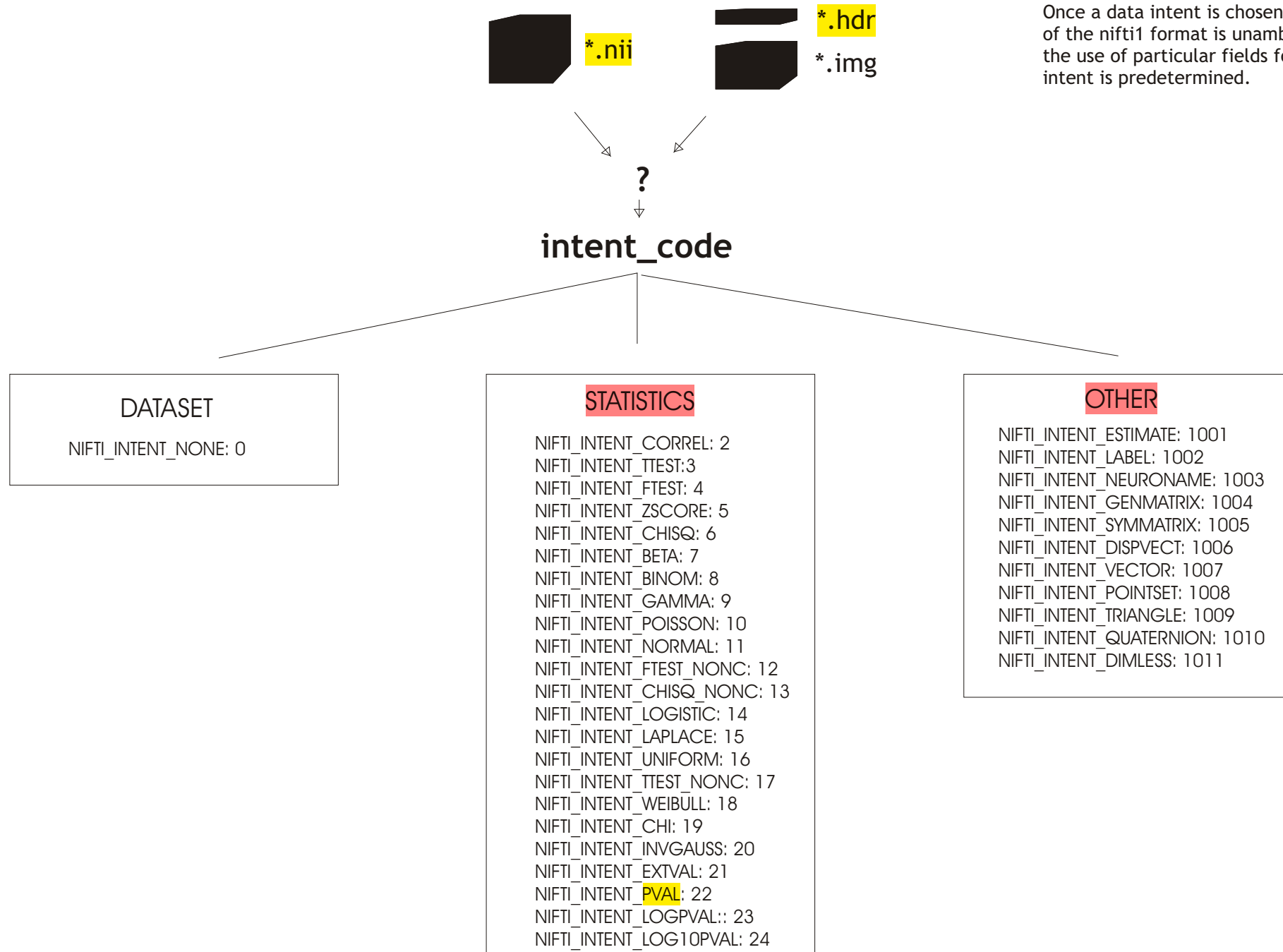


THE NIFTI1 DATA FORMAT

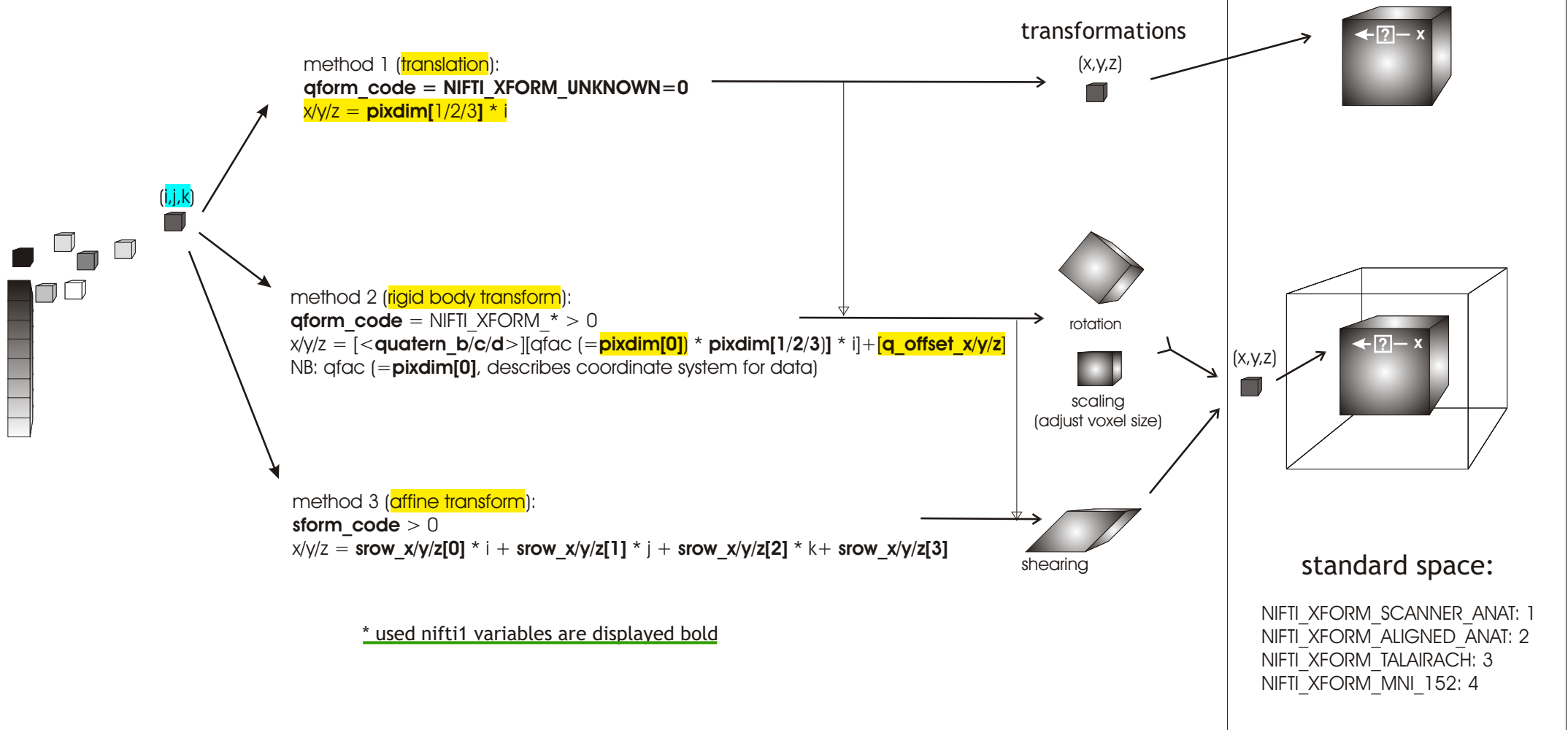
NIFTI1 can store data with different meanings. Imaging data, statistical values and other data (any vector, matrix, label set or mesh). can be saved in a nifti1 *.nii or *.hdr/*.img file. Once a data intent is chosen, the use of the nifti1 format is unambiguous since the use of particular fields for a certain intent is predetermined.



To determine the position of the voxel in the dataset, method 1 is used (translation). Methods 2 and 3 serve also for reconstructing rigid body and affine transformations so that the positions of the voxels within the dataset in a stereotactic space can be determined.

NIFTI_INTENT: DATASETS

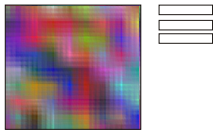
Locating position of voxel in dataset:
how to use the nifti1 variables for datasets



Nifti1 can also be used to store values drawn from a given distribution. For this purpose, many intent_types are dedicated to describe statistical tests. Univariate and multivariate tests can be stored, including the used parameters. In nifti1, it is possible to save more than one values per voxel (even a matrix per voxel).

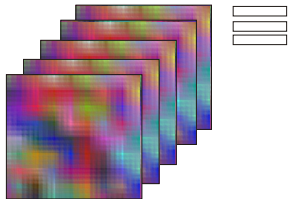
NIFTI_INTENT: STATISTICS

How to use the nifti1 variables for statistical values



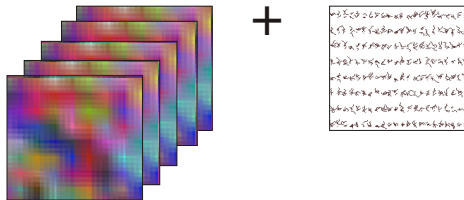
dim[3] = 1: single slice

dim[5] = 1: statistical parameters stored in *intent_p1/2/3* (parameters applied to whole dataset)



dim[3] > 1: several slices

dim[5] = 1: statistical parameters stored in *intent_p1/2/3* (parameters applied to whole dataset)



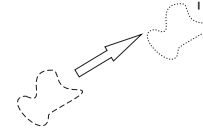
dim[5] > 1: voxel-wise statistical parameters stored in data planes after stat value plane, for example the degrees of freedom

NIFTI_INTENT: OTHER

How to use the nifti1 variables for other intents

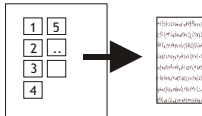
~

NIFTI_INTENT_ESTIMATE: 1001
parameter for estimate in **intent_name**

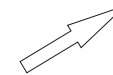


NIFTI_INTENT_DISPVECT: 1006
parameter at each voxel is displacement vector
dim[5] = dimensionality of displacement
(e.g. 2 = in-plane, 3 = spatial)

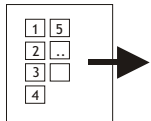
NIFTI_INTENT_LABEL: 1002
parameter at each voxel is index to label
defined in **aux_file**



NIFTI_INTENT_VECTOR: 1007
parameter at each voxel is vector



NIFTI_INTENT_NEURONAMES: 1003
parameter at each voxel is index to label
in NeuroNames label set



NIFTI_INTENT_POINTSET: 1008
value at each voxel is spatial coordinate
(vertices/nodes of surface mesh)
dim[0] = 5
dim[1] = nr of points
dim[2/3/4] = 1



NIFTI_INTENT_GENMATRIX: 1004
parameter at each voxel is matrix
dim[0] = 5
dim[5] > 1: M * N
intent_p1: M (float)
intent_p2: N (float)

[M x N]

row order:
[m][n]0 → (n-1)
0
↓
(m-1)



NIFTI_INTENT_TRIANGLE: 1009
value at each voxel is triple of indices (forming triangle)
from a pointset
dim[0] = 5
dim[1] = nr of triangles
dim[2/3/4] = 1
dim[5] = dimensionality of space
intent_name can describe the objects where points
come from ("pial", "gray/white", "EEG" etc)

NIFTI_INTENT_SYMMATRIX: 1005
parameter at each voxel is symmetrical matrix

[N x N]

dim[0] = 5
dim[5] > 1: N * (N + 1)/2
intent_p1: N (float)

row order:
[0][0]
[1][0] [1][1]
[2][0] [2][1] [2][2]

[4 x 4]

NIFTI_INTENT_QUATERNION: 1010
vector value at each voxel is quaternion
dim[0] = 5
dim[5] = 4

NIFTI_INTENT_DIMLESS: 1011
dimensionless value