File name	Sequence	VoxelToWorldMatrix (4 x 4 matrix)				Dimension (x,y,z,t)	Data type / byte ordering
case1_fMRI.raw	fMRI	2.994719505310059	-0.1779192239046097	-1.201156862862263e-08	-89.32270050048828	64,64,36,100	unsigned int16 / little endian
		0.1773206740617752	2.984649419784546	0.2703971564769745	-106.674186706543		
		-0.01457840669900179	-0.2453829348087311	3.28890323638916	-22.97527122497559		
		0	0	0	1		
(*) case1_fMRI_tMAP.raw	fMRI t-map	2.99471950531006	-0.17791922390461	-1.20115686286226e-08	-89.3227005004883	64, 64, 36, 1	float / little endian
		0.177320674061775	2.98464941978455	0.270397156476974	-106.674186706543		
		-0.0145784066990018	-0.245382934808731	3.28890323638916	-22.9752712249756		
		0	0	0	1		
(**) case1_DTI.raw	DTI (diffusion-weighted images)	1.794009327888489	-0.09666856378316879	0.03420480713248253	-107.7457733154297	128, 128, 72, 62	unsigned int16 / little endian
		0.09445105493068695	1.790551543235779	0.1293596029281616	-125.7801818847656		
		-0.03724772110581398	-0.1155765876173973	1.975473642349243	-40.25832366943359		
		0	0	0	1		
case1_T1_post.raw	T1 post contrast, N3 intensity corrected	-0.05724509432911873	-0.002962826518341899	-0.9930853247642517	106.3236465454102	512, 512, 176, 1	unsigned int16 / little endian
		0.4849123954772949	0.0008071824559010565	-0.1172499656677246	-127.7092361450195		
		0.00114893615061045	-0.4882713556289673	0.005832202266901731	116.0096435546875		
		0	0	0	1		
case1_T1_post_tumormask.raw	Tumor segmentation	-0.05724509432911873	-0.002962826518341899	-0.9930853247642517	1.393469572067261	44, 43, 19, 1	unsigned int8 / little endian
		0.4849123954772949	0.0008071824559010565	-0.1172499656677246	17.32006454467773		
		0.00114893615061045	-0.4882713556289673	0.005832202266901731	81.72914886474609		
		0	0	0	1		
case1_T1_pre_brainmask.raw	Brain mask based on pre contrast T1	-0.05860297381877899	-0.001692513702437282	-0.9935299754142761	106.2399139404297	512, 512, 176, 1	unsigned int8 / little endian
		0.4847515225410461	-0.000204624404432252	-0.1201106309890747	-127.0562210083008		
		-1.184334941228826e-08	-0.4882780313491821	0.003494198899716139	116.7083969116211		
		0	0	0	1		
case1_T1_pre.raw	T1 pre-contrast, N3 intensity corrected	-0.05860297381877899	-0.001692513702437282	-0.9927655458450317	106.2395248413086	512, 512, 176, 1	unsigned int16 / little endian
		0.4847515225410461	-0.000204624404432252	-0.1200182214379311	-127.056266784668		
		-1.184334941228826e-08	-0.4882780313491821	0.003491510637104511	116.7083969116211		
		0	0	0	1		
case1_FLAIR.raw	FLAIR	0.4483248889446259	-0.02832658030092716	-0.003970428369939327	-86.51061248779297	432, 512, 24, 1	unsigned int16 / little endian
		0.02823803387582302	0.4464985132217407	0.5407986044883728	-125.5127639770508		
		-0.002257697749882936	-0.04042759910225868	5.975576877593994	-50.41564559936523		
		0	0	0	1		
case1_T2.raw	T2	0.35852912068367	-0.02463969029486179	-0.006541388109326363	-86.40677642822266	544, 640, 24, 1	unsigned int16 / little endian
		0.02457579225301743	0.3570880591869354	0.5370038151741028	-126.1543350219727		
		-0.001815958297811449	-0.03211537748575211	5.975916862487793	-51.51309204101562		
		0	0	0	1		
case1_SWI.raw	SWI (susceptibility weighted images)	0.8970050811767578	-0.05047772824764252	0.01334583479911089	-77.39154052734375	192, 256, 60, 1	unsigned int16 / little endian
		0.05006756633520126	0.8951905965805054	0.1602791100740433	-122.8127670288086		
		-0.008015030063688755	-0.05724125728011131	2.494821071624756	-56.31328201293945		
		0	0	0	1		

(*) You can use this t-map, if you have not your own fMRI tools for evaluating the fMRI data (case1_fMRI.raw)
If you want to analyze the fMRI dataset yourself, you have to know the used paradigm:
It begins with **10 volumes activation** followed by **10 at rest**. **5 cycles** were performed to get 100 volumes.
For the provided t-Map the 5%, 1% and 0,1% significance thresholds correspond to these t-Values using False Discovery Correction method:
5% - 2.8163
1% - 3.4279
0.1% - 4.1859

(**) DTI data: 30 diffusion sensitizing directions were used and the number of excitations (NEX) is 2.
At the beginning of each excitation, one B_0 has been acquired. That means, the sequence in the t-dimension is as follows:
One **B_0** image, **30 diffusion-weighted gradients**, one **B_0** image**, 30 diffusion-weighted gradients**. Thus, overall, t = **62** images are available for each anatomical slice. The **b-value** is **1000**.
The **gradient scheme** for the 30 diffusion-weighted images is:

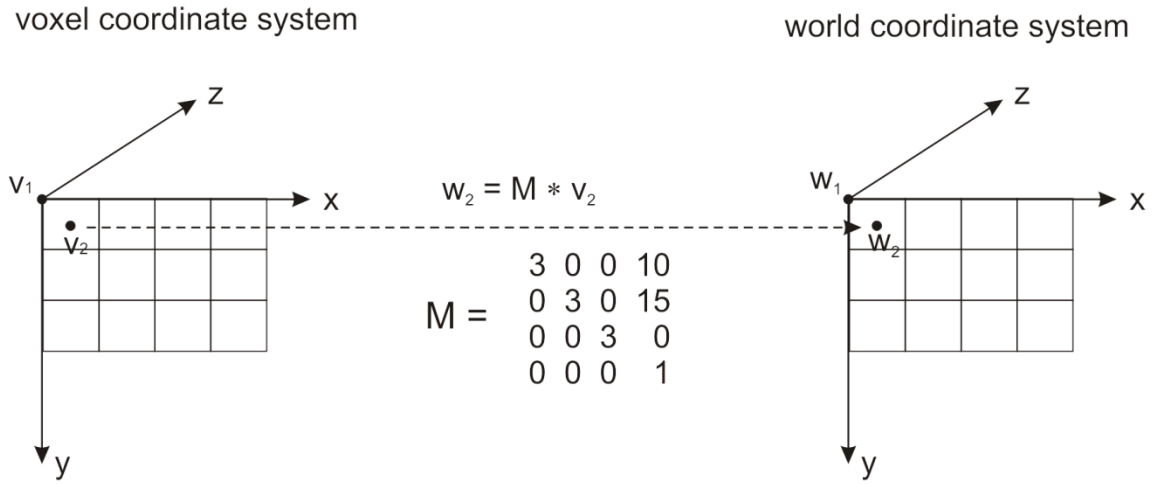
-0.20316298 -0.52240086 -0.82814378
0.19837686 -0.52297902 -0.82893878
0.40371078 -0.17805667 -0.89739257
-0.40407982 -0.73386353 -0.54604375
-0.20174906 -0.94292772 -0.26492411
-0.85222679 -0.52036119 -0.05416229
-0.73158294 -0.52194691 -0.43858632
-0.40805301 -0.17854710 -0.89532870
-0.73408896 -0.17835702 -0.65521157
-0.64898384 -0.73224169 0.20649958
-0.32126319 -0.94155931 0.10127255
-0.32402194 -0.52262664 0.78858817
-0.64949858 -0.52315557 0.55177891
-0.97823954 -0.17950523 0.10404437
-0.85470557 -0.17986068 0.48695832
0.00210645 -0.73366684 0.67950600
0.00349019 -0.94274104 0.33350730
0.65403271 -0.52191073 0.54758590
0.32996047 -0.52309948 0.78580719
0.19816579 0.17932798 -0.96362412
0.20433427 -0.17908071 0.96238136
0.65020293 -0.73202717 0.20340200
0.32354867 -0.94131631 0.09612516
0.20068364 -0.94162840 -0.27030057
0.40459251 -0.73366910 -0.54592538
0.73371565 -0.17810377 -0.65569848
0.72961622 -0.52148885 -0.44239065
0.85194236 -0.52018380 -0.06002662
0.85786074 -0.18008229 0.48129547
0.97880262 -0.18003200 0.09764180

Note that all data sets have been linearly co-registered to the 3D-T1 reference data set. The 3D T1 data sets have been corrected for MR intensity inhomogeneties using a standard algorithm (N3, nonparametric non-uniformity normalization). The fMRI data has been motion-corrected and analyzed using a general linear model (GLM).

Each voxel (x,y,z) can easily be transformed into world coordinates by multiplying the voxel values by the corresponding VoxelToWorldMatrix M: **M x (x,y,z,1)^T** . All VoxelToWorld matrices can be found in the table above, and additionally as separate ascii files which come along with the raw data.

The voxel coordinate system and its transformation into the world coordinate system is defined as follows:

Example:



v_1 defines the voxel coordinate system point (0,0,0)

v_2 defines the voxel coordinate system point (0.5, 0.5 ,0)

w_1 defines the world coordinate system point (10,15, 0)

w_2 defines the world coordinate system point (11.5 ,16.5, 0)

We have put together some resources to get you started in case you are not familiar with MRI and the type of images provided here. There is a wealth of information available on these techniques. A good place to start reading might be Wikipedia, the following entries in particular:

http://en.wikipedia.org/wiki/Magnetic_resonance_imaging

http://en.wikipedia.org/wiki/Diffusion_MRI

http://en.wikipedia.org/wiki/Fmri

Also, the following books might be of interest:

S. Mori, Introduction to Diffusion tensor Imaging, Elsevier, 2007

S. Mori et al., "MRI Atlas of Human White Matter", Elsevier, 2005

H. Johansen-Berg, T. E.J. Behrens, "Diffusion MRI", Academic Press, 2009

S. A. Huettel et al., Functional Magnetic Resonance Imaging, Sinauer Associates, 2004

If you need tools to work with the fMRI or DTI datasets, have a look at the following free tools (there are a lot more though...):

3D-Slicer - http://www.slicer.org/

Camino - http://www.cs.ucl.ac.uk/research/medic/camino/

FSL - http://www.fmrib.ox.ac.uk/fsl/

Also, we can provide add-on packages for MeVisLab that allow analysis of fMRI and DTI datasets. Contact us, if you're interested in trying them out.