OASIS FACT SHEET (rev. 2009-6-20)

LONGITUDINAL MRI DATA IN NONDEMENTED AND DEMENTED OLDER ADULTS

Marcus et al., 2009

Summary

This data set consists of 373 MR data sets collected from 150 subjects aged 60 to 96 including individuals with early-stage Alzheimer's Disease (AD). Each subject was imaged on 2-4 occasions, with a minimum between session interval of 180 days (mean = 719 days). For each imaging session, 2-4 individual T1-weighted scans are included. The subjects are all right-handed and include both men (62) and women (88). 64 of the subjects were diagnosed with very mild to mild AD at the time of their initial scan. 13 of the subjects were initially diagnosed as nonmedented but converted to a diagnosis of very mild to mild AD at the time of a subsequent scan. 1 was initially diagnosed as demented but reverted to a CDR of 0 at the time of a subsequent scan. 72 of the subjects were initially diagnosed as nondemented and maintained that status at the time of each subsequent scan. All data have been anonymized to accommodate public distribution. The raw data set is 18 GB compressed and 43 GB uncompressed. The full set, including post-proecessed images, is xxx GB compressed and xxx GB uncompressed. Instructions for obtaining the data are available at http://www.oasis-brains.org.

Image data

For each subject, a number of images are provided, including: 1) 3-4 images corresponding to multiple repetitions of the same structural protocol within a single session to increase signal-to-noise, 2) an average image that is a motion-corrected coregistered average of all available data, 3) a gain-field corrected atlas-registered image to the 1988 atlas space of Talairach and Tournoux (Buckner et al., 2004), 4) a masked version of the atlas-registered image in which all non-brain voxels have been assigned an intensity value of 0, and 5) a grey/white/CSF segmented image (Zhang et al., 2001). **All images are in 16-bit big-endian NiFTI format.** A fiducial marker is present of the subject's left temple in most acquired images.

Directory structure and file names

The contents of the DVD and downloadable archive files are organized by imaging session. Data from each MRI session exists in its own directory labeled by the subject ID. The random subject ID uses the format OAS1_xxxx, where 'xxxx' represents a number from 00001 to 9999 (e.g., OAS1_0012). For each of a subject's imaging sessions, an ID has been assigned of the format OAS1_xxxx_MRy, where y represents an incrementing number to reflect the imaging visit number for the subject (e.g., OAS1_0012_MR1).

Each session directory includes an XML file, a text (TXT) file, and three subdirectories: RAW, PROCESSED, and FSL_SEG.

The **XML file** includes acquisition details and anatomic measures derived from the scan images. A full description of the OASIS XML format can be found at http://www.oasis-brains.org/schemas/.

The **TXT file** includes the same information as the XML but is converted to text format for viewing.

The **RAW directory** includes the individual scan images.

The **PROCESSED directory** includes two additional subdirectories: SUBJ_111 and T88_111. SUBJ_111 includes the averaged, co-registered image of the individual scan images in the native acquisition space in resampled to 1mm isotropic voxels. T88_111 includes the atlas-registered gain field-corrected image and a brain-masked version of that image resampled to 1mm isotropic voxels. It also includes a subdirectory called t4_files that includes the matrices describing the transformation into atlas space.

The **FSL_SEG directory** includes the grey/white/CSF segmentation image generated from the masked atlas image. A summary of the image files can be found in Table 1.

Additional data

Demographic, clinical, and derived anatomic measures are located in the spreadsheets files (oasis_cross-sectional.xls and oasis_cross-sectional.csv) included on the DVD distribution and on the OASIS website. Table 2 summarizes demographic and dementia status.

Demographics

Gender (**M/F**), Handedness (**Hand**), **Age**, Education (**Educ**), socioeconomic status (**SES**) (Rubin et al., 1998). Education codes correspond to the following levels of education: 1: less than high school grad., 2: high school grad., 3: some college, 4: college grad., 5: beyond college.

Clinical

Mini-Mental State Examination (**MMSE**) (Rubin et al., 1998), Clinical Dementia Rating (**CDR**; 0= nondemented; 0.5 – very mild dementia; 1 = mild dementia; 2 = moderate dementia) (Morris, 1993). All participants with dementia (CDR >0) were diagnosed with probable AD.

Derived anatomic volumes

Estimated total intracranial volume (**eTIV**) (mm^3) (Buckner et al., 2004), Atlas scaling factor (**ASF**) (Buckner et al., 2004), Normalized whole brain volume (**nWBV**) (Fotenos et al., 2004).

Name	Description	Dimensions	Vox. size	Orient
OAS1_xxxx_MRy_mpr-z_anon	Individual scan (z=repetition)	256x256x128	1x1x1.25	Sag
OAS1_xxxx_MRy_mpr_ni_anon _sbj_111	Image averaged across scans (i=# of scans)	256x256x160	1x1x1	Sag
OAS1_xxxx_MRy_mpr_ni_anon _111_t88_gfc	Gain-field corrected atlas registered average	176x208x176	1x1x1	Trans
OAS1_xxxx_MRy_mpr_ni_anon _111_t88_masked_gfc	Brain-masked version of atlas registered image	176x208x176	1x1x1	Trans
OAS1_xxxx_MRy_mpr_ni__anon 111_t88_masked_gfc_fseg	Brain tissue segmentation	176x208x176	1x1x1	Trans

Table 1. Images included in the data set. All images are in Analyze 7.5 format and include separate image (.img) and header (.hdr) files. 'z' in the above files names indicates the scan repetition. Most sessions include 3-4 repetitions. 'i' represents the number of images included in the averaged image.

		Nondemented					Demented				
Age Group	**N**	**n**	**mean**	**male**	**female**	**convert**	**n**	**mean**	**male**	**female**	**CDR 0.5/1**
60s	35	23	65.71	6	17	3	11	65.67	8	3	8/3
70s	71	35	74.91	11	24	4	36	73.97	20	16	29/7
80s	41	26	84.30	9	17	7	15	82.33	7	8	13/2
90s	4	2	92.50	0	2	0	2	93.00	1	1	1/1
Total	**150**	**86**	**75.82**	**26**	**59**	**14**	**64**	**74.95**	**36**	**29**	**52/13**

Table 2. Summary of subject demographics and dementia status.

References

Buckner, RL, Head, D, Parker, J, Fotenos, AF, Marcus, D, Morris, JC, Snyder, AZ, 2004. A unified approach for morphometric and functional data analysis in young, old, and demented adults using automated atlas-based head size normalization: reliability and validation against manual measurement of total intracranial volume. Neuroimage 23, 724-38.

Fotenos, AF, Snyder, AZ, Girton, LE, Morris, JC, and Buckner, RL, 2005 Normative estimates of cross-sectional and longitudinal brain volume decline in aging and AD. *Neurology*, 64: 1032-1039.

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