

Thanks for your participation in the Data Format Working Group (DFWG) and, for most of you, in the meeting at NIH in July. The meeting was very successful in identifying important next steps in addressing the issues around data formats in fMRI. I present these below (and attached) as “deliverables”.

In addition to the description of deliverables, I also indicate from whom we would like these delivered (which we discussed at the meeting in July), and when we would like these delivered (the timetable was arrived at with Steve Strother’s input). Please feel free to contact me with any questions that you might have about this. Thanks—Mike

1. Available Formats and Format Converters

Members of the DFWG will iteratively and eventually put together a list of widely used formats (i.e., used beyond one group), available format converters, and information about the formats and converters. This information will ultimately be publicly posted on the NIfTI web site.

Providing information about formats and format converters in a systematic way at one web site will be useful to the fMRI research community at large. In addition, this information will be useful to the DFWG and to NIfTI in deciding possible next steps. For example, DFWG might use this information in deciding whether a particular converter should be tested and validated, whether a new converter needs to be developed, etc.

Formats

Since formats evolve, clear-cut, authoritative information about a given format or version of it might not be available. Ultimately, DFWG members will be asked to obtain particular types of information for particular formats, but this goal will need to be addressed iteratively.

The first step is to generate the list of formats to be dealt with. Steve Strother recommends that this be done by building a list of relevant image analysis tools and their formats. Steve Strother’s initial effort at such a table, extracted from David Kennedy’s (Massachusetts General Hospital) registry, with some additions, is as follows:

Analysis Tool	Data Formats	Comments
AFNI	Brick/?	Can write analyze
AIR 5.0	Analyze ¹ /Proprietary/?	
BRAINS		
Brain Voyager	Analyze ¹ /DICOM ²	
FIASCO	Pittsburgh ³	
FreeSurfer		
FSL	Analyze+	

Lyngby	Analyze ¹ /VAPET ⁴	
MEDx	Analyze ¹	
NIS	Pittsburgh ³	
NPAIRS	Analyze ¹ /VAPET ⁴	
scanSTAT		
SPM'99	Analyze+	
Stimulate	Proprietary	
TAL		
VoxBo		

¹ <http://www.mayo.edu/bir/Software/AVW/AVWTechInfo.html#formats>

² <http://www.dclunie.com/> (Thanks to Steve Smith for this and the next link)

Note that there is a new DICOM proposal for fMRI etc.:

ftp://medical.nema.org/medical/dicom/final/sup49_ft.pdf

³ http://www.stat.cmu.edu/~fiasco/index.php?ref=overview/pff_intro.shtml

⁴ http://neurovia.umn.edu/papers/tech_reports/vapet_format.html

Steve Strother asks DFWG members to extend and complete this table and indicate with which format each member is familiar.

The list itself might be a useful addition to the NIFTI website with a request to the community at large to identify anything that is missing. Steve Strother recommends that we try to assemble a comprehensive list at this initial stage so that we can see how many packages large and small share formats, and then restrict our considerations at the format level.

ACTION ITEM 1: Each DFWG member is asked to add analysis tools, formats, and/or provide other information to the table above, and indicate which format(s) he or she is familiar with. DUE DATE: November 8.

Format Converters

For each format converter with which you are familiar, please provide the following information: 1) which format it converts from, i.e., input format, 2) which format it converts to, i.e., output format, 3) link at which the converter and/or solid info about it is available, 4) language and version of language in which it is written in (e.g., C/'89), 5) requirements (e.g., for MINC, libraries need to be installed), 6) other important general comments regarding the converter.

ACTION ITEM 2: Each DFWG member is asked to provide information above for any converter he/she or his/her colleagues use. DUE DATE: October 15.

ACTION ITEM 3: Each member is also asked to provide the name of anyone they know who has developed converters (e.g., Mark Cohen was

mentioned as having converters between Bshort, Bfloat, etc.). People so identified will be contacted and asked to send info about their converters. DUE DATE: November 8.

2. Papers Describing How to Enhance of Two Existing Formats

Discussions at the DFWG meeting in July made clear the importance of having both simple formats and complex formats. The DFWG decided that a possible solution to these dual needs is to make available a simple format and a complex format, as well as a robust and well characterized converter between them.

For a number of reasons that were discussed, ANALYZE and MINC were identified as formats that could be enhanced to provide simple and complex formats, respectively. As the next step in considering this solution, DFWG members decided to form two subcommittees. One of these would draft a document that would outline how to enhance ANALYZE. (Consideration of an extended ANALYZE format was offered to the DFWG in a document by R. Cox and posted on the DFWG web site <http://nifti.nimh.nih.gov/dfwg/>.) The other subcommittee would draft a document that would outline how to enhance MINC. Such enhancements might include not only the format itself, but also documentation, etc.

ACTION ITEM 4A: *The ANALYZE subcommittee, comprising J. Ashburner, R. Cox (lead author), K. Fissell, J. Lancaster, S. Smith, and J. Van Horn, will draft document outlining how to enhance ANALYZE. DUE DATE: December 15.*

ACTION ITEM 4B: *The MINC subcommittee, comprising C. Haselgrove, C. Holmes (lead author), R. Goebel, D. Rex, and S. Strother, will draft document outlining how to enhance MINC. DUE DATE: December 15.*

3. Metadata and Design Matrix Paper

An important component of data formats is the manner in which they address metadata. Since there is a range of opinions even about what constitutes metadata, the DFWG decided that a document addressing key issues pertinent to metadata be drafted. An aspect that is of particular interest to the DFWG and should receive special attention in this document is consideration of how to incorporate information about the experimental design in a format—how to generate a design matrix within a format.

ACTION ITEM 5: *The Metadata and Design Matrix Paper will be drafted by J. Ashburner, R. Cox, K. Fissell, D. Rex, and S. Smith (lead author). DUE DATE: December 15.*