RSNA QIBA
Open Image Archives Requirements Project

fMRI User Requirements Gathering Session

November 2, 2011

Goal

- RSNA is exploring utilizing an Open Image Archive (OIA) to store, organize, and disseminate important imaging datasets.

- Understanding individual project requirements is critical to getting this right.

- The goal for this session is to walk through OIA requirements categories and capture fMRI priorities and needs.

OIA Requirements Categories

- **Archive Representation and Input**
  - Sheet 3: Data Acquisition
  - Sheet 1: Data Model
  - Sheet 2: Metadata

- **Archive Functionality**
  - Sheet 7: View/Query/Analyze
  - Sheet 4: Business Analytics and Metrics

- **Additional Areas**
  - Sheet 6: Computing Environment
  - Sheet 5: Workflow
  - Sheet 8: Regulatory Aspects
  - Sheet 12: Performance
  - Sheet 14: Availability/Reliability
  - Sheet 16: Accessibility/Usability
  - …

Notes

- Current Practice
  - Emailing or FTPing
  - Have not really exchanged data yet
  - Needs to happen in the next 6 months
  - General plans to archive the QIBA data
  - Not prepared to spend an enormous amount of time to prepare the data
  - NITRC site has a straightforward and simple way to make blocks of data available

Notes

- DICOM datasets (over time)
  - All include DTI
  - Inefficient for large datasets
  - Also convert to afni or analyze (nifti) format
    - Add headers (three different forms)
- Behavioral task information
  - What person did during exam
  - Synchronization information
- Comments and conditions
- Actual visual stimulus
- Detailed description of paradigm
- Potentially store audio/visual movie of task data
- Potentially store QC data (quality metric)

- Ultimately be able to reproduce experiments

Notes

- <u>NFTI</u> and NTRC have been developing lexicons
  - Does not handle behavior side well
  - Software developers are not motivated to support
- Working with DICOM to better describing extensions/improvements for fMRI
- Analysis of data
  - Brain Function maps
  - Fiber tracts (no clear standard)

Notes

- Brain function maps
  - 3D image data, statistically parameterized overlay
  - May be stored in dicom format
  - Parameters for threshold and cutoffs
- Single study in 100s MB, compression by 2x typical
- High resolution (< 2mm) can near gigabytes per study

Notes

- Search
  - Example: search for females with GBM tumors
- Online review of images is helpful
  - JPG summary images
  - Embedded viewer

- Running analysis on archive server and view is a nice to have

Notes

- Additional documents and papers would be useful

- What will archive be used for?
  - Dissemination has basic requirements
  - Qualification process will add requirements
    - Analysis tools?