QIBA fMRI Biomarker Committee (BC) Call

Wednesday, August 8, 2018 at 11 AM CT
Call Summary

In attendance

Feroze Mohamed, PhD (Co-chair)
Jay J. Pillai, MD (Co-chair)
David Soltysik, PhD (Co-chair)
Shruti Agarwal, PhD
Ping Hou, PhD

Edward Jackson, PhD
Andrew Kalnin, MD
Anthony Liu, PhD
Nancy Obuchowski, PhD

Uma Ranjan, MSc, PhD
Flavius Raslau, MD
Jim Voyvodic, PhD
Yuxiang Zhou, PhD, DABR

RSNA staff

Joe Koudelik
Susan Stanfa

Review of Previous Call Summary

- The 07.25.18 call summary was approved as presented

Sharing of fMRI Profile Versions and Literature Articles

- Pros and cons of potential methods were discussed
- Quantitative Imaging Data Warehouse (QIDW): an open image archive hosted by the RSNA
  - Not designed for working on Profile documents or posting literature articles
  - "…supports both operational needs for basic research into quantitative imaging and secondary analysis of archived images and meta-data"
  - "…data include images from QIBA-created or recommended physical test objects (i.e., phantoms) digital (i.e., synthetic) reference objects (DROs) and clinical images with associated meta-data…"
  - Information about the QIDW and link to the landing page is available on the RSNA website at: http://www.rsna.org/QIDW/
  - Direct link to QIDW landing page: http://qidw.rsna.org/ (access to files can be obtained by clicking "Register" in the upper right corner)
  - fMRI Profile supporting data requires a log-in
  - fMRI working folder requires log-in and is restricted to core fMRI members

- QIBA Wiki
  - Can view all content and files without a log-in
  - Located at: http://qibawiki.rsna.org/index.php/Main_Page
  - Log-in required only to post; QIBA BC members can request access/registration
    - Check if you already have an account at: http://qibawiki.rsna.org/index.php/Special:ListUsers; request password by sending an email to: QIBA@rsna.org
    - For help with posting files: http://qibawiki.rsna.org/index.php/Help:Contents
  - Due to copyright restrictions, PDFs of articles cannot be posted on the QIDW or QIBA Wiki; recommendation to post URLs to or citations of articles
  - fMRI draft/working Profiles and supporting references can be posted on the committee page at: http://qibawiki.rsna.org/index.php/FMRI_Biomarker_Ctte
  - Profiles that have completed one of the QIBA Profile Stages of development and have been approved by their Biomarkers Committees are published at: http://qibawiki.rsna.org/index.php/Profiles
    - BC leaders encouraged to keep the latest Profile drafts posted to this dedicated committee page

- Google Drive: offers users a host of office tools, allowing them to simultaneously edit and collaborate on stored files without leaving the cloud site
  - Files exist in one, central location that can be accessed 24/7 by any team members and can be edited or updated remotely
  - **NOTE: As long as the user works directly in the cloud-based Google Doc within the Google Drive** (does not download the file to their local computer), **versioning will not be an issue since document changes are saved instantly in the cloud**
  - If needed, previous document versions can be recovered via "Version History" from the "File" menu
  - Provides convenience, efficiency and flexibility; eliminates need to circulate Profile versions among editors
  - Comments can be made and questions can be asked directly in a Google doc, eliminating the need for email conversation chains
  - Dr. Reuss created fMRI repository with the Gmail address: QIBA.fMRI@gmail.com
    - Google would need to verify identity by text and one Gmail account is not meant for multiple users
    - **Note that Google accounts <u>don't have to use Gmail addresses</u>; a Google account is simply a unified sign-in system that provides access to Google products and any email address can be associated with a Google account (information on file-sharing permissions for organizations can be found here: https://support.google.com/a/answer/60781?hl=en)**
    - To transfer ownership of a folder or file(s) from QIBA.fMRI@gmail.com to current Profile editor, visit: https://support.google.com/drive/answer/2494892
    - The Google fMRI Drive currently serves as a repository for fMRI-related literature and Profiles; Dr. Mohamed will send out access invitations upon request sent to: feroze.mohamed@gmail.com

Co-Registration Issue
- The co-registration issue in both Profile 1.0 and 2.0 was discussed during the July 25 fMRI BC call
  - Optimal and acceptable methods need to be specified in 1.0
  - It was suggested to verify co-registration without recommending a procedure, as procedures themselves are not always completely reliable

- Dr. Raslau provided the following presentation: "Peeking into the black box of co-registration in clinical fMRI: Which registration methods are used and how well do they perform?" – Flavius D. Raslau, Leanne Lin, Anders H. Andersen, Charles D. Smith and Edward J. Escott (University of Kentucky College of Medicine)
  - Conclusions
    - Not all registration methods are created equal; some may introduce systematic error
    - LPC outperforms the others in this study; available only in Prism, though not default
    - Boundary-based registration available only in FMRIB Software Library (FSL)
    - There is no industry standard for optimal co-registration, so this will be addressed in the fMRI Profiles

  - fMRI BC members asked questions/provided feedback to Dr. Raslau
    - Method for "objective assessment of the quality" was requested; objective criteria for considering one assessment over another was requested
      - Error less than 5 mms

- - Vendors provide manual matching option; recommendation to visually inspect and manually realign
  - It was pointed out that there are different levels of contrastive edges (e.g., R2* mapping) with different types of images
  - It would be useful if more vendors provided LPC as an option for analysis, but manual inspection/nudging may be used as a gold standard
  - Recommendation to look at in all three axes, as manual nudging might improve edge registration in one area, but worsen it in another

- Additional discussion needed on quality assessment so that variance in coregistration methods can be understood

Summary of Motion DRO Results (Dr. Voyvodic)
- This topic was tabled until the next fMRI BC call on August 22
- Dr. Soltysik encouraged fMRI BC members to attend fMRI Bias TF calls and to notify him if Tuesday at 1 PM CT is not accommodating
- fMRI BC members were reminded to review the check list and submit responses to RSNA staff

Next calls:
- QIBA fMRI Bias TF call – Tuesday, August 14, 2018 at 1 PM CT
- QIBA fMRI Biomarker Committee call – Wednesday, August 22, 2018 at 11am CT