QIBA Multi-parametric Metrology TF Call

04 January 2021 at 2 PM CT

Call Summary

In attendance			**RSNA**
Nancy Obuchowski, PhD (Chair)	Maryellen Giger, PhD	Bernice Hoppel, PhD	Joe Koudelik
Andrew Buckler, MS	Alexander Guimaraes, MD, PhD	Erich Huang, PhD	Julie Lisiecki
Patricia Cole, PhD, MD	Timothy Hall, PhD	Ying Tang, PhD	
Jana Delfino, PhD	Charles Hatt, PhD	Xiaofeng Wang, PhD	
Nandita deSouza, MD			

Moderator: Dr. Wang

Approval of Call Summary

- The notes from December 21, 2020 were approved as presented

Review of Use case #4 (Dr. Wang): topics included:

- Suggestion to reconstruct paper and trim section 2 to a single paragraph and merge with section 3
- Move figures regarding the phantom and reproducibility studies to after "feature extraction" section
- Possibly add a machine learning category, distinguished from deep learning
    - More specific definition of terms may be needed re: machine learning vs. deep learning and characteristic extraction since radiology and computer science use these in different ways
    - Both could be automated, analytic or model-driven type
    - Deep learning could be tied to prediction output
    - Dr. Giger also mentioned how deep learning may be referred to as "deep transfer learning" in medical imaging situations
        - Also, if there are multiple deep learning networks, there are multiple features for study
- New section 3 proposed that could include the following:
    1. 3.1 – multidimensional assessments
    2. 3.2 – phenotype classification
    3. 3.3 – risk prediction
        - Pitfalls and limitations for the use cases could be discussed in this section
        - Questions remain regarding how to address the different standards for the three cases
- Reproducibility from site-to-site may be better worded as "generalizability"
- A case study is needed for section 4
- Ideas regarding how to emphasize the phenotype classification in the NLST lung study are needed
- Mr. Buckler provided recommendations for essential claim components
- The team decided on the term "data-driven imaging biomarkers" on the last call for use case #4
- Steps needed to perform radiomics in an outline format
- Suggestion to remove "claim" and refer to "components" to avoid confusion with Profile claims
- Computational markers will not be included in this version of the paper
- Sample size determination for training and testing may require additional content
- Section 4 needs to emphasize phenotype classification and risk prediction elements of the chosen example to highlight how specific considerations mentioned in section 3 support the components for these elements
- Dr. Wang has a lung cancer dataset for examples
- Dr. Wang will update the paper with suggested edits and redistribute for review

Action items:

- Use case #4 - Dr. Wang to incorporate edits and send updated paper for review
- Use case #3 - Request review of sections 3 and 4, with comments to Dr. Huang: erich.huang@nih.gov
- Dr. deSouza to share any available literature regarding progression with the group

Next call: Use case #1 (Dr. Raunig) on Wednesday, January 20th at 10 am CT

Call Schedule: Presenters: please review.

Date:	Topic:	Lead:
Wednesday, Jan 20 (10 am CT)	Use case 1: Multi-dimensional descriptor	Dr. Raunig
Monday, Feb 1 (2 pm CT)	Use case 2: Phenotype classification	Dr. Delfino
Wednesday, Feb 17 (10 am CT)	Use case 3: Risk prediction	Dr. Huang
Monday, March 1 (2 pm CT)	Use case 4: Radiomics	Dr. Wang

Use cases:

- **Use case 1**: (Multi-dimensional descriptor) a panel to determine how to care for a patient
- **Use case 2**: (Phenotype classification) rule or decision tool to diagnose phenotype
- **Use case 3**: (Risk prediction) several biomarkers will be evaluated to create a prediction or risk score
- **Use case 4**: (Radiomics) may not have a specific biomarker for reference