

QIBA Project Progress report

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fMRI Round-1 Project #10a

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Quantitative measures of fMRI reproducibility for pre-surgical planning

Voyvodic Sub-project: Development of reproducibility metrics

This sub-project started 7/15 and is currently in its 8th month. We have continued to make progress on all 3 data collections and the deliverables proposed for our analyses.

Recent efforts have focused on the following:

- 1) We have now generated AMPLE normalized activation maps for all subjects who underwent multiple scan sessions in our local data collections and the FBIRN Phase 1 data. Motor and language maps in the local data collections have been compared and submitted for publication (the QIBA-supported language reproducibility paper has been accepted with minor revisions by JMIR and those revisions are currently being reviewed). The FBIRN data analysis is still underway.
- 2) We are developing automated processing scripts to analyze AMPLE temporal stability for all functional data sets. We anticipate that these normalized stability metrics will be strongly correlated with fMRI scan quality in general and reproducibility in particular. These automated scripts will be applied to all data sets.
- 3) The relational imaging database has been improved to include clinical and behavioral meta-data for each scan session, with appropriate links to the associated imaging data. This makes the data set collections more useful in general; it also allows our local image processing software (fScan) to find image data sets and run automated analysis scripts based on database queries of arbitrary subject or scan session properties.
- 4) Both the Deyoe lab in Wisconsin and the Pillai lab in Maryland have installed our fScan software and have been using it to perform AMPLE normalization analyses on their own data sets. We discuss these results in our biweekly reproducibility calls.

QIBA supported publication:

J.T. Voyvodic (2012 in review) "Reproducibility of single-subject fMRI language mapping with AMPLE normalization", J. Mag. Res. Imaging

QIBA supported presentation:

J.T. Voyvodic (March 2012) "Quantitative reproducibility of clinical fMRI mapping of language and motor function", oral abstract presented at the Amer. Soc. Func. Neuroradiol. Annual meeting