

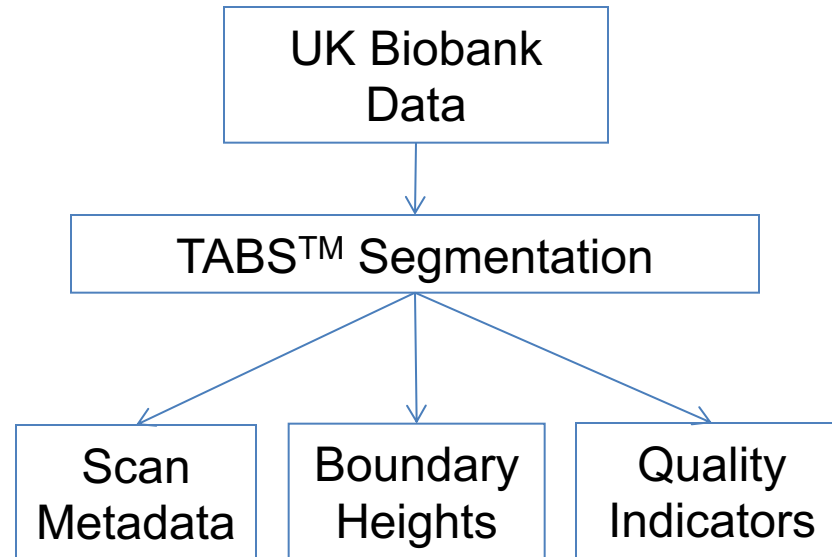
UK Biobank 2014 talk excerpt

Data Set Analysis Methodology

- 134,642 Topcon OCT-1000 macular 6x6mm² data sets were processed (both eyes of 67,321 subjects)
 - Processing successful for all but 31 data sets
 - Those 31 data sets failed for either of two reasons:
 - The data set was withdrawn from the study (30 out of 31 data sets)
 - The data set was corrupted (1 data set)
- Processing such a large amount of data in a timely manner required automation and parallelization

Analysis Methodology

- All data sets were processed using Topcon's Standalone Segmentation Utility with TABS™ segmentation (v1.6.1.1) to produce scan metadata and quality indicators, in addition to the boundary height information



TABS™ = Topcon Advanced Boundary Segmentation

Data Reduction based on Scan Quality and Segmentation Indicators

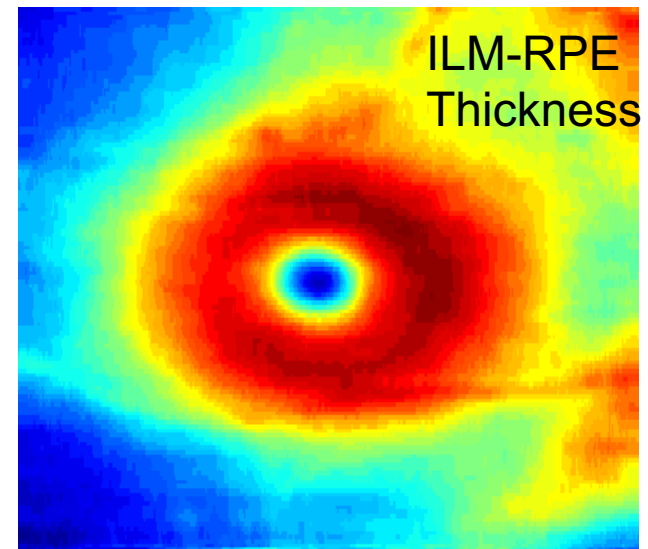
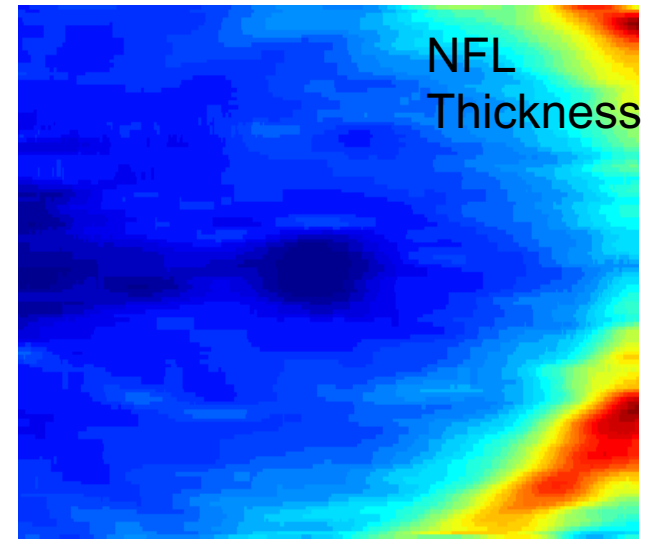
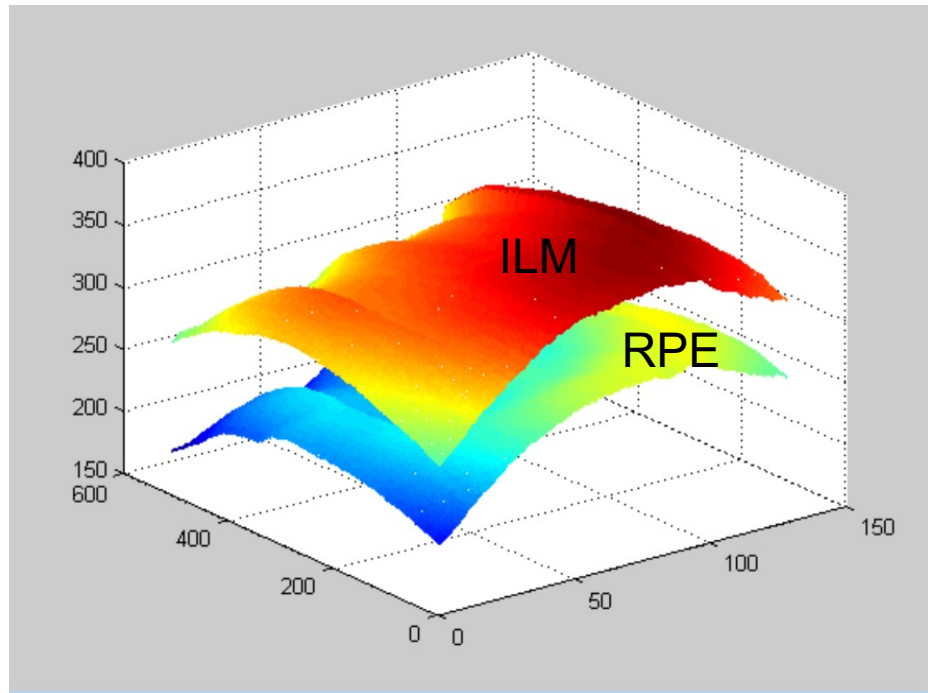
- FastQ Image Quality Indicator
- Segmentation Indicators:
 - **ILM Indicator:** indicates the edge strength around the ILM boundary over the weakest region of the scan
 - **Valid Count:** provides a count of the number of A-lines within the scan that – based on the ILM and BM/Choroid boundary segmentations – were not cropped
 - **Motion Information:** useful to identify blinks, motion artifacts, and segmentation failures within a scan: Min Motion Correlation; Max Motion Delta; Max Motion Factor.

Data Acceptance Criteria

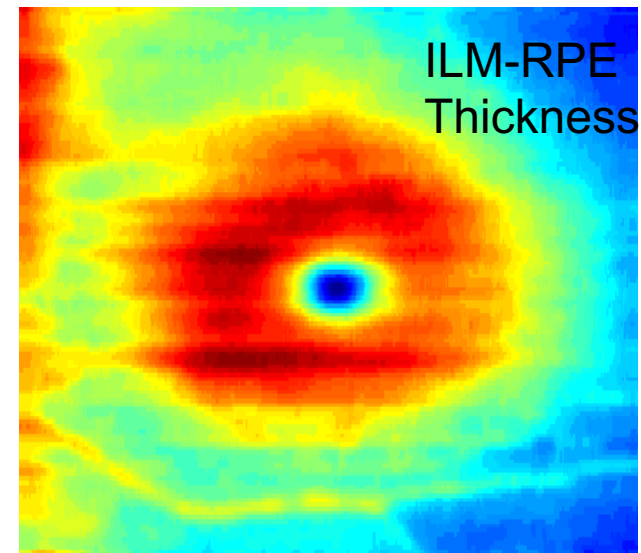
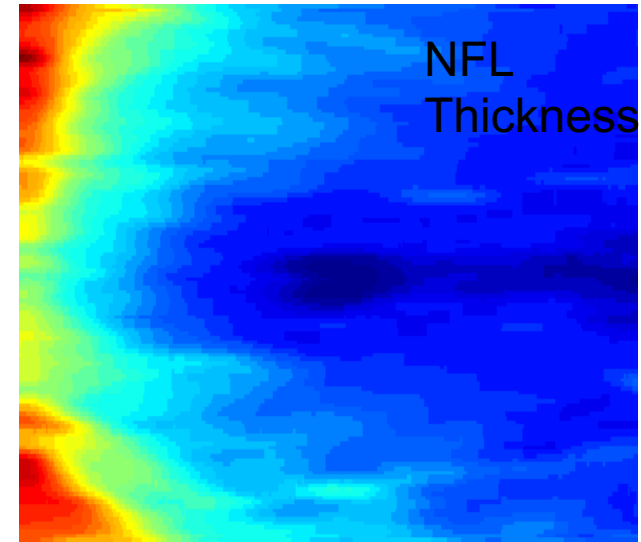
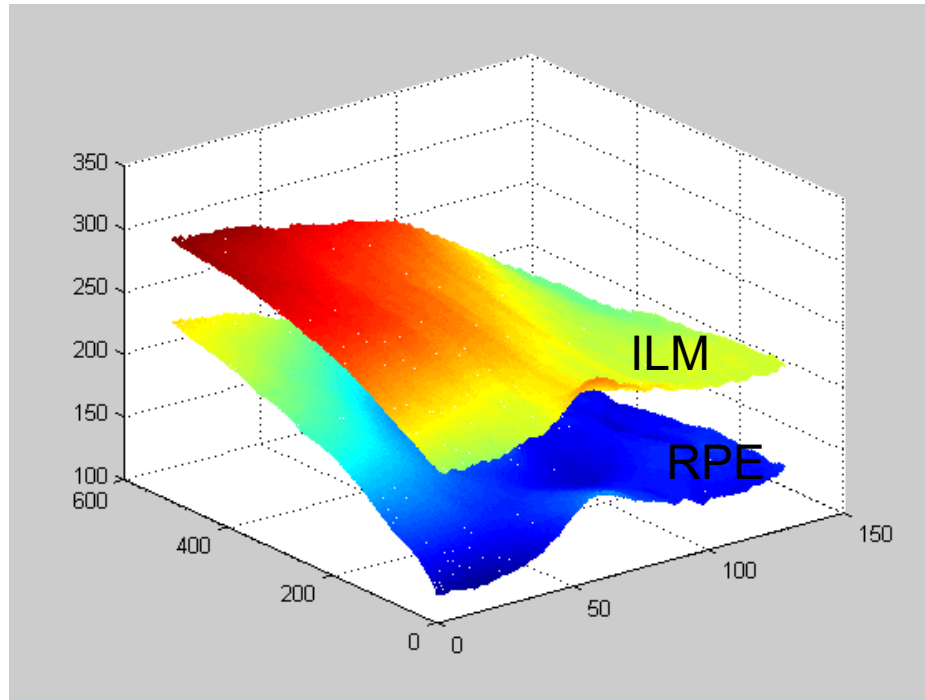
- **FastQ ≥ 45**
 - In addition to being Topcon's recommended threshold, served to eliminate approximately 9% of data sets)
- All Segmentation Indicators cutoff values were set so as to exclude 10% of UK Biobank data sets for each indicator:
 - ILM_Indicator ≥ 0
 - Valid_Number ≥ 744
 - Min_Motion_Correlation ≥ 0.63
 - Max_Motion_Delta ≤ 3.6
 - Max_Motion_Factor ≤ 1.0
- After applying criteria, about 77.5% of data sets remained
 - Note that there is significant correlation between indicators

Data Acceptance/Exclusion Results

- Examples of both accepted and rejected data set segmentation results are illustrated in the following slides.

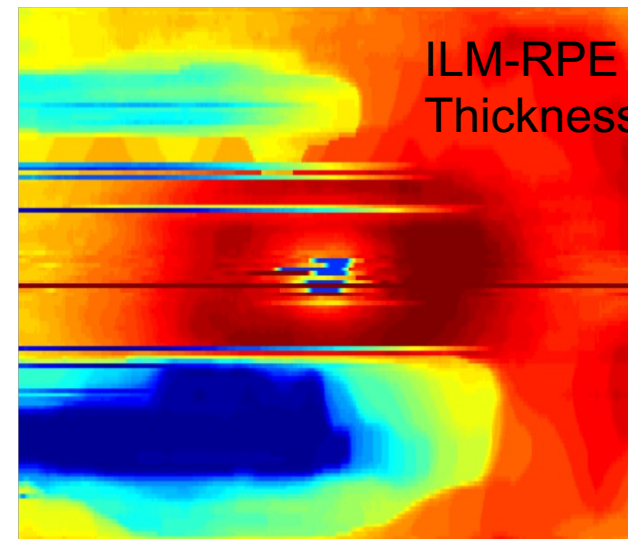
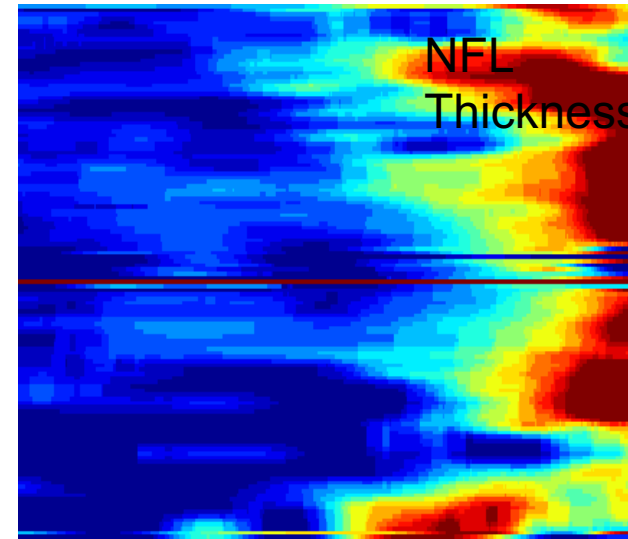
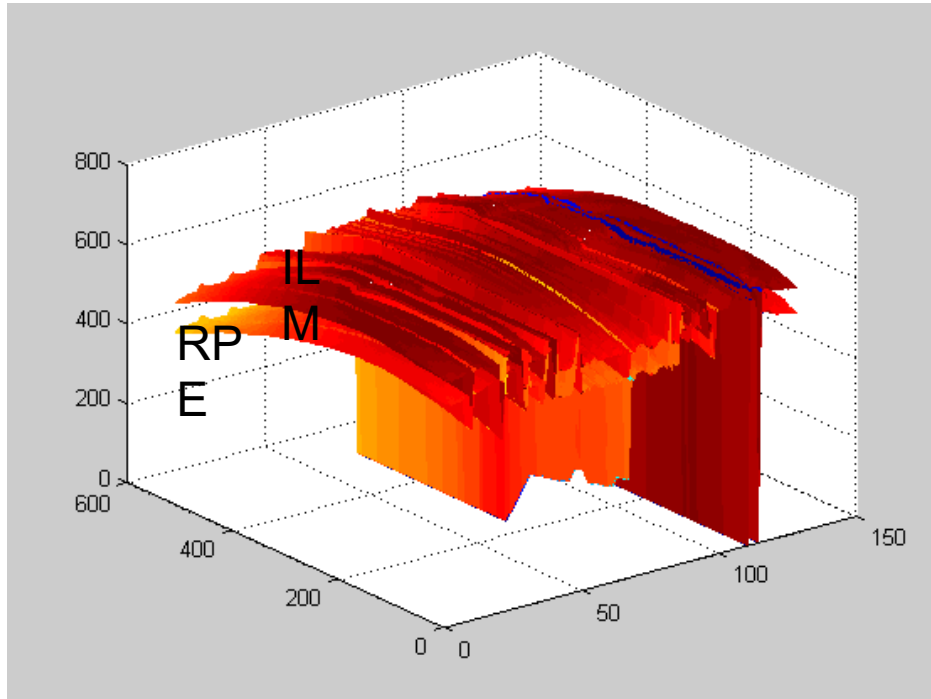


FastQ [75], fILMIndicator[3671], nValidCount[961], fMinMotionCorr[0.97],
fMaxMotionDelta[0.89], fMaxMotionFactor[0]



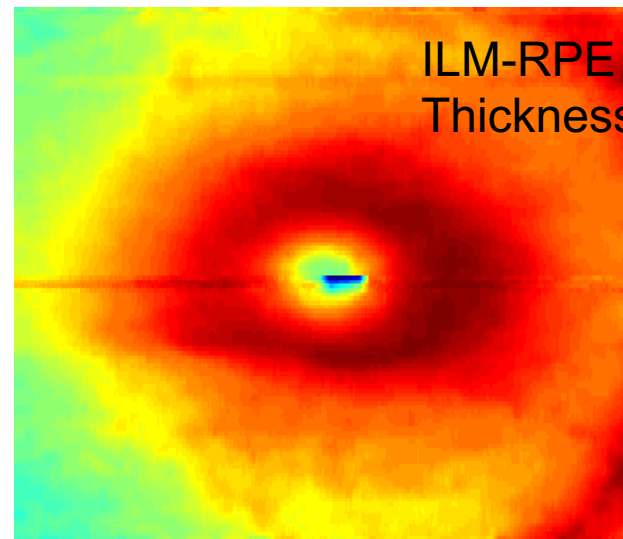
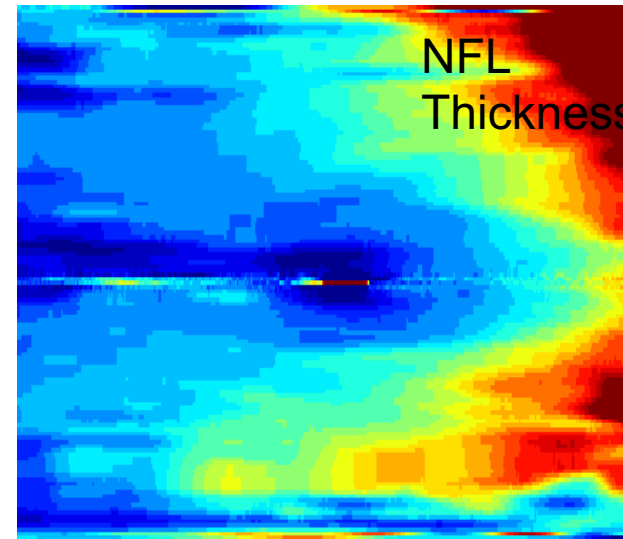
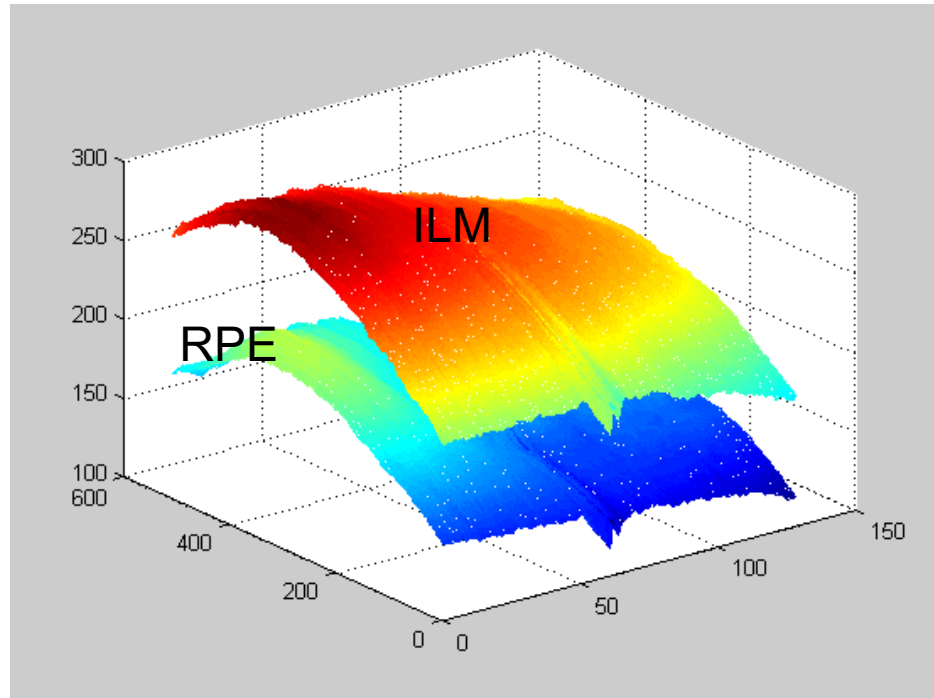
FastQ [77], fILMIndicator[3790], nValidCount[961], fMinMotionCorr[0.98],
fMaxMotionDelta[0.99], fMaxMotionFactor[0]

Rejected Data Set Example ..\00\1225100_21014_0_0



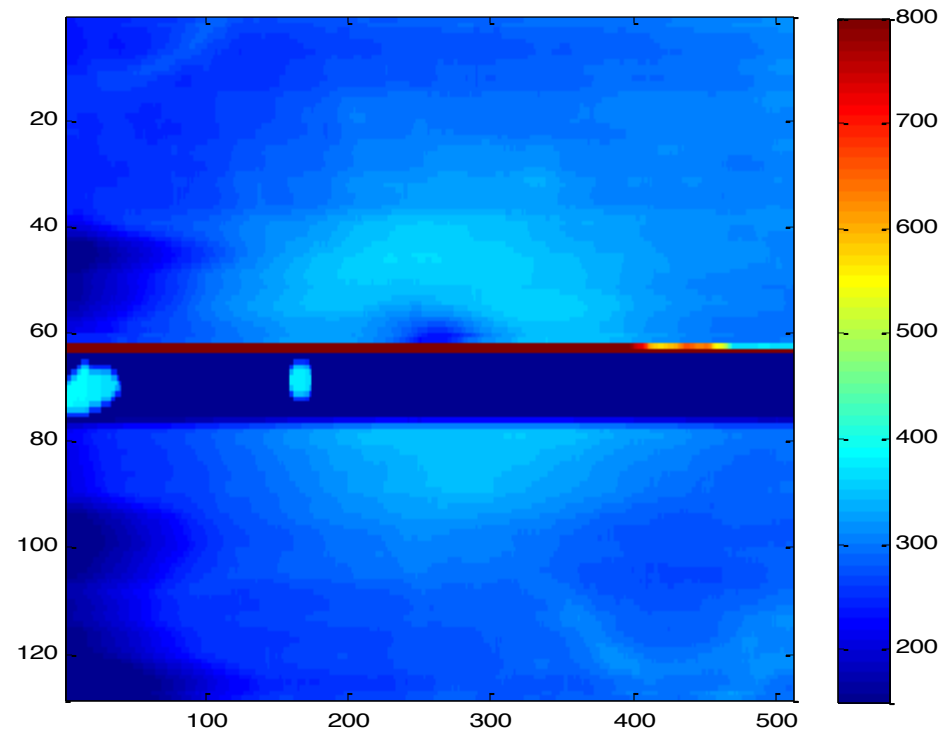
FastQ [13], fILMIndicator[0], nValidCount[295], fMinMotionCorr[-0.07],
fMaxMotionDelta[350.12], fMaxMotionFactor[350.12]

Rejected Data Set Example ..\01\3048401_21014_0_0



FastQ [32], fILMIndicator[211], nValidCount[961], fMinMotionCorr[-0.27],
fMaxMotionDelta[4.79], fMaxMotionFactor[4.79]

Data Set Example ..\00\2598400_21014_0_0



FastQ [69], fILMIndicator[993], nValidCount[0], fMinMotionCorr[-0.92],
fMaxMotionDelta[496], fMaxMotionFactor[496]