

Volumetric registration and averaging of OCTA data for enhanced image quality



Luis de Sisternes, PhD¹; Warren Lewis, MS²; Thomas Callan, OD¹; Sophie Kubach, MS¹; Roger Goldberg, MD, MBA³; Mary Durbin, PhD¹

¹Carl Zeiss Meditec, Inc., Dublin, CA; ²Bayside Photonics, Inc., Yellow Springs, OH; ³Bay Area Retina Associates, Walnut Creek, CA

Poster # PB057

PURPOSE

Averaging multiple optical coherence tomography angiography (OCTA) structural and flow volumes is a powerful technique to improve quality but it can be memory and time consuming. In this work we introduce a method to average multiple OCTA acquisitions in a fast manner.

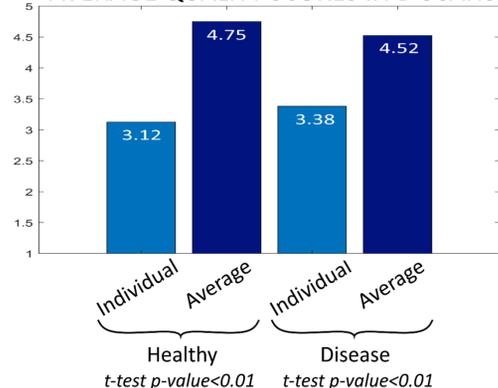
METHODS

- Reference volume automatically chosen as the one with highest angiography quality.
- Volumetric registration functions obtained using structural and flow information: Topographically, using common keypoints in flow data projections, and axially, using retinal layer information in the structural data. Average structure and flow volumes generated by combining the registrations of each repetition.
- Benefits over using 2-dimensional averaging of flow slabs: Visualizing averaged B-scans of higher quality and employing the averaged volumes in processing algorithms (e.g., segmentation).

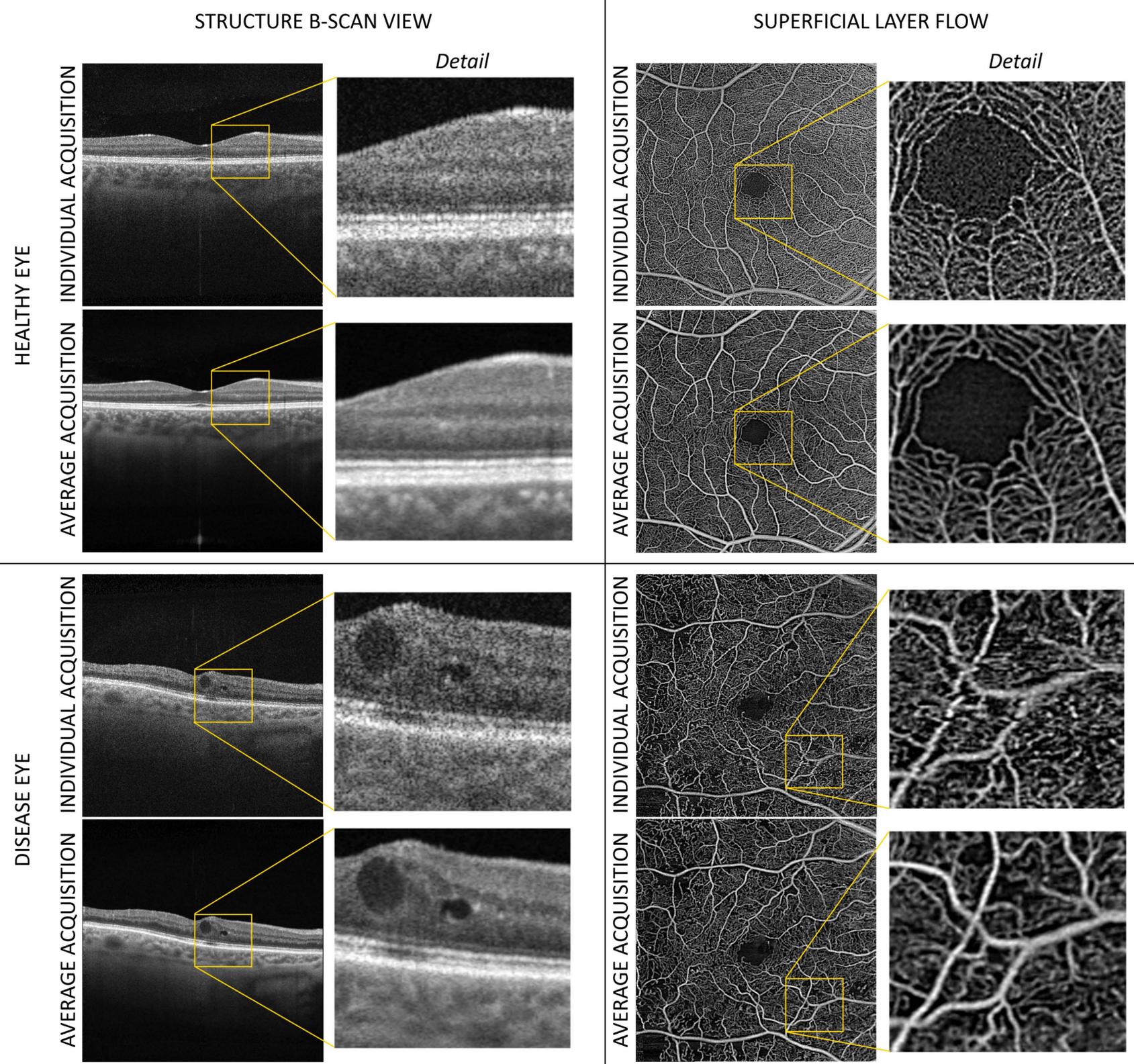
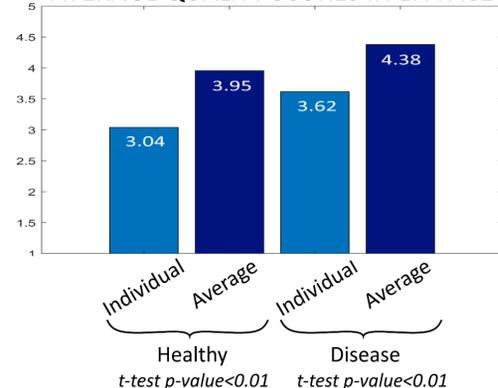
RESULTS

- Processed 240 OCTA 6x6mm volumes from 23 healthy and 22 disease eyes, with at least 3 repeated acquisitions per eye (5.33 repetitions on average). Collected using a PLEX[®] Elite 9000 with AngioPlex[®] OCT Angiography (ZEISS, Dublin, CA).
- Individual acquisitions of highest quality from each repeated set and averaging results were graded by visual inspection of both B-scan and en face views by a reviewer in a scale of 1-5.

AVERAGE QUALITY SCORES IN B-SCANS



AVERAGE QUALITY SCORES IN EN FACE



CONCLUSIONS

The presented method can average repeated OCTA volumes producing results of enhanced quality in a relatively fast manner (in the matter of seconds versus other more time-consuming approaches).

Email: Luis.desisternes@zeiss.com

Disclosures: LdS (E), WL (C), TC (E), KS (E), RG (C), and MD (E): Carl Zeiss Meditec, Inc