

# Abstract: OCT-OCTA Segmentation

## A Novel Framework and an Application to Segment Bruch's Membrane in the Presence of Drusen

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In this work, a novel paradigm for segmenting optical coherence tomography (OCT) and optical coherence tomography angiography (OCTA) is presented [1]. Since it uses OCT and OCTA information jointly it is called “OCT-OCTA segmentation” and its usefulness is demonstrated by segmenting the Bruch's Membrane (BM) in the presence of drusen. Therefore a fully automatic graph-cut algorithm was developed and evaluated by comparing the automatic segmentation results with manual segmentation in 7 eyes (6 patients;  $73.8 \pm 5.7$  y/o) with nascent geographic atrophy and/or drusen associated geographic atrophy. The absolute pixel-wise error between the segmentation curves were: mean:  $4.5 \pm 0.89 \mu\text{m}$ , 1<sup>st</sup> quartile:  $1.9 \pm 1.35 \mu\text{m}$ , 2<sup>nd</sup> quartile:  $3.9 \pm 1.90 \mu\text{m}$ , 3<sup>rd</sup> quartile:  $6.3 \pm 2.67 \mu\text{m}$ , which results in an absolute mean error less than the optical axial resolution of the OCT system ( $8 - 9 \mu\text{m}$ ). The algorithm was also qualitatively assessed in healthy eyes ( $n = 13$ ), eyes with diabetic retinopathy ( $n = 21$ ), age-related macular degeneration (AMD) ( $n = 14$ ), exudative AMD ( $n = 5$ ), geographic atrophy (GA) ( $n = 6$ ), polypoidal choroidal vasculopathy ( $n = 7$ ) and choroidal neovascularization (CNV) ( $n = 7$ ). The resulting segmentation contours were mostly accurate enough to form en face projections for further analysis and in cases with poorer results a correction algorithm based on outlier detection and Laplacian interpolation was applied to achieve proper results.

## References

1. Schottenhamml J, Moulton EM, Novais EA, et al. OCT-OCTA segmentation: a novel framework and an application to segment Bruch's membrane in the presence of drusen. Invest Ophthalmol Vis Sci. 2017;58(8):645–645.