

Computer aided Quantification of Capillary Non-perfusion and Drusen

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Computer aided automated detection and quantification of the capability non- perfusion and retinal drusen was explored.

1. Capillary Non-perfusion. Regions of capillary non-perfusion (CNP) were detected using analytic properties of the intensity profiles of fundus fluorescense angiogram (FFA) images. We analyzed the images obtained from two different kinds of imaging systems- the digital angiogram from the Carl Zeiss Fundus camera, and the confocal images the Heidelberg retinal tomogram. The technique exploited the density of local extrema of the FFA image intensities. The density of extrema was relatively high in the CNP areas compared to other regions. We designed the system to outline the CNP area, and then quantified using the area measure given by the pixel count of the regions. The aggregated area is reported as the percentage of area detected as regions of CNP in the entire image.

2. Drusen Detection. Drusen were detected from the color images exploiting the analytic properties of the drusen. The characteristic frequency of the drusen boundary domain properties were used to identify the drusen from color fundus images. We used the green-channels of the color fundus images in the analysis technique since they have the best contrast for drusen detection. A bank of oriented and band-limited filters, which respond maximally to drusen boundaries, were applied on the green channel of the color fundus images to enhance the drusen boundaries. The drusen were quantified by the area measure given by the number of pixels inside each closed boundary of the drusen.

We are working to expand the current technique to other kinds of retinal lesions. We consider that the automated computer aided detection of these and other retinal lesions will be helpful in clinical practice, research and teaching.