## ON THE AUTOMATIC COMPUTATION OF THE ARTERIO-VENOUS RATIO UNIVERSIDADE DA CORUÑA IN RETINAL IMAGES

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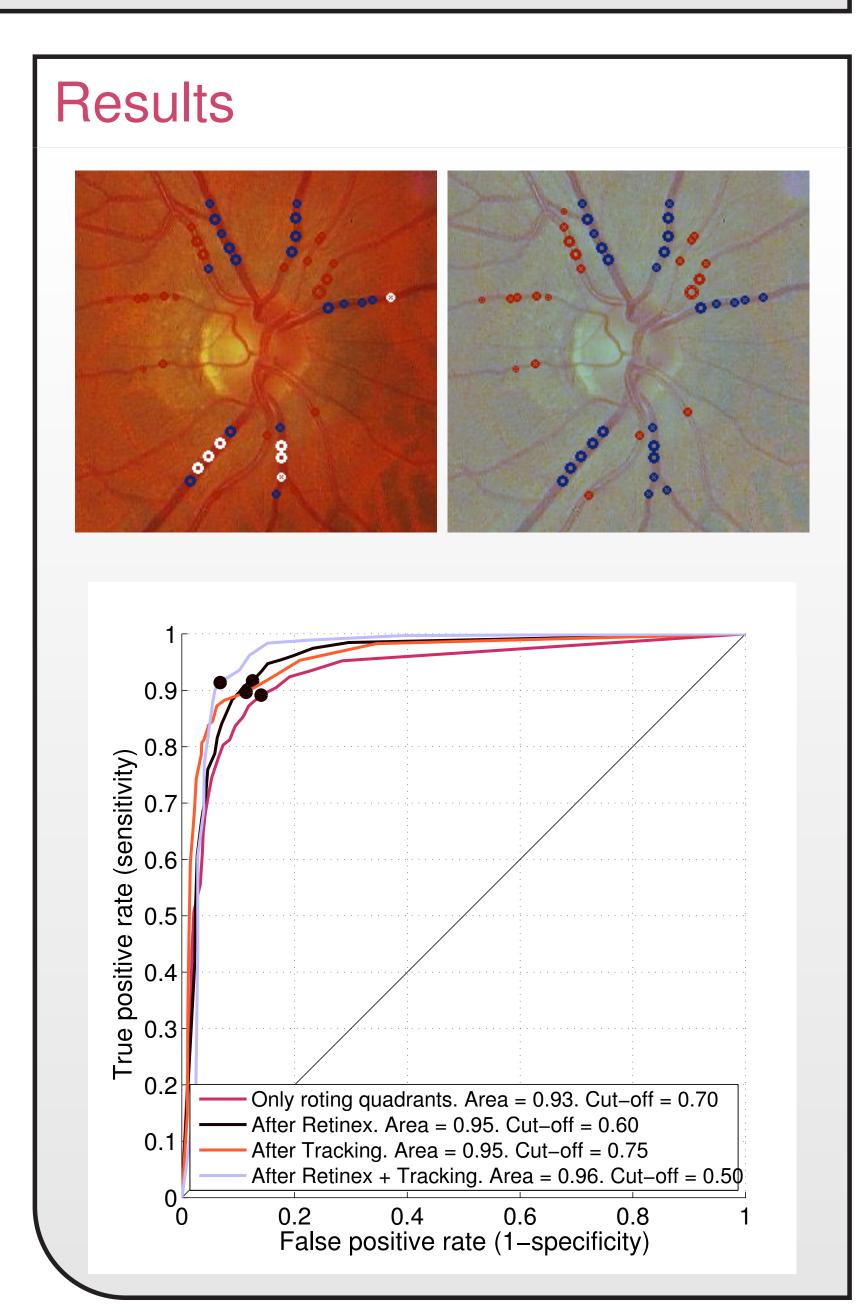
## **Abstract**

Abnormalities in the retinal vessel tree are associated with different pathologies. Usually, they affect arteries and veins differently. Thus, the arterio-venous ratio (AVR), is a measure of retinal vessel caliber, widely used in medicine to study the influence of these irregularities in disease evolution. Hence, the development of an automatic tool for AVR computation as well as any other tool for diagnosis support need an objective, reliable and fast artery/vein classifier.

# Pixel colors (green channel) in artery and vein vessels in a retinal image. Differences of acteristics sure acteristics sure.

- Arteries are lighter than veins.
- Differences decrease with the vessel diameter.
- Intra-image uneven lightness due to biological characteristics such as pigmentation.
- Inter-image lightness and contrast variability.

## Methodology AVR computation Area of interest is a concentric zone around the optic disc, between Optic disc location once or twice the optic disc radius from optic disc margin. deformable model (snake) is adjusted to Vessel segmentation $\rightarrow$ the vessel boundaries, in several analysis radius, using crest points as the seeds. Labeling Caliber measurement AVR computation Automatic Vessel Classification A profile is a 1 pixel thick segment Profile extraction perpendicular to a vessel. Retinex enhancement Retinex is applied to achieve color constancy. Vessel clustering Voting K-means clustering based on rotating quadrants is Tracking applied to vessels found in each circumference. The median of G (RGB) in the We use a minimal path approach to join the vessels located at profile is used as clustering feature. different radius to support the classification by voting.



## Conclusions

The method bases the classification not only on the local lightness but also on the color along the vessel. The vessel clustering is still local but the tracking strategy and multi-scale retinex technique minimize the effect of the lightness variability of the image.

### References

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