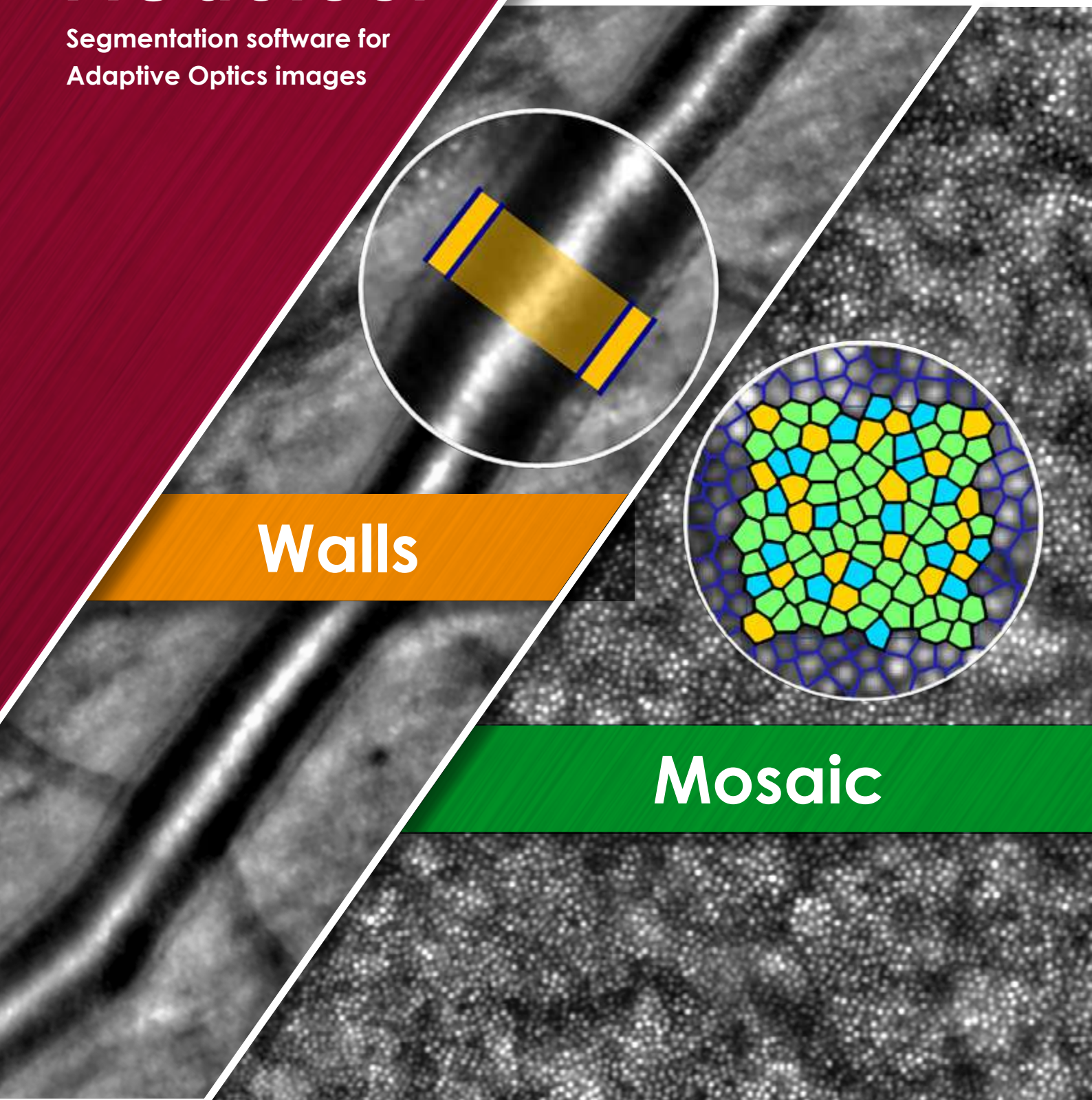
Add investigational value to the rtx1™ AO Retinal Camera

imagine eyes®

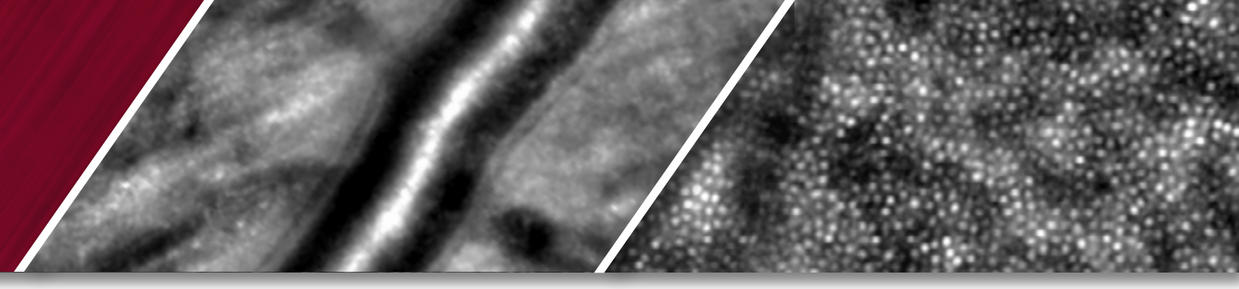
AOdetect™

Segmentation software for Adaptive Optics images



AOdetect™

Quick and simple analysis of rtx1™ Adaptive Optics Retinal Images



Adopted by rtx1 users to analyze AO retinal images

AOdetect is a semi-automated application for the segmentation and analysis of ultrahigh resolution images acquired with the rtx1 AO retinal camera.

Developed in collaboration with clinicians, it computes local descriptors of the structure of retinal arterioles and the distribution of parafoveal cone cells. These metrics provide candidate AO biomarkers for clinical investigations. With AOdetect, you are in complete control as all automated segmentations can be manually corrected in just a few clicks.

Quick 2-step analysis
- Define a region of interest in 1 click and instantly compute local descriptors
- Review and save the results

2 families of descriptors
- Walls : for arteriolar wall structure
- Mosaic : for parafoveal cone distribution

Simple workflow
- Capture images with the rtx1 software
- Open AOdetect with a single click

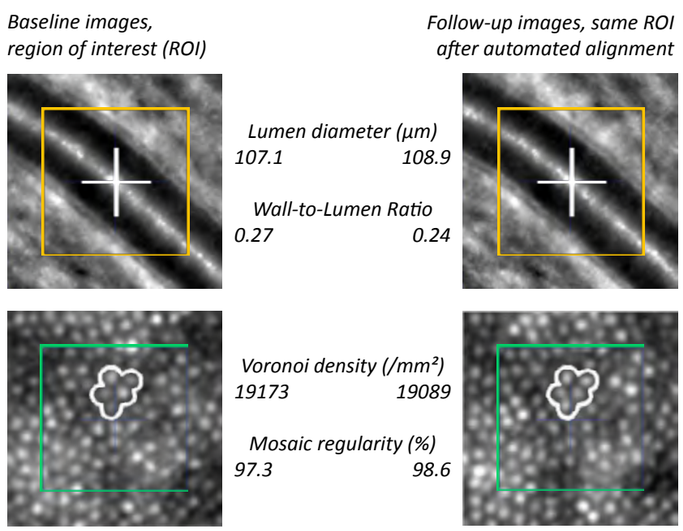
Accurate and reliable
- Walls: reproducibility 3.2% for WLR, and 1.3% for internal diameter [1]
- Mosaic: reproducibility 4% [2]

rtx1 + AOdetect : cellular follow-up made easy

Thanks to its high-precision alignment algorithm, the rtx1 delivers follow-up images that are perfectly aligned with the baseline image.

AOdetect enables analyzing the exact same region of interest in baseline and follow-up images.

This is how you can easily monitor a specific group of cells or a chosen vascular section over time.



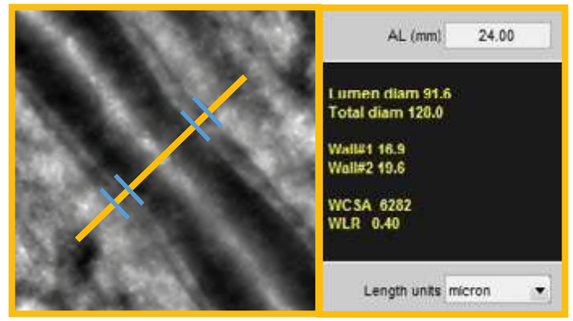
Walls

For images of retinal arterioles

Automated wall segmentation and thickness computation

Manual correction : click-and-drag to displace the wall borders while monitoring their position in the gradient profile

Walls descriptors
- Internal and external diameter
- Wall thickness
- Wall Cross Section Area (WSCA)
- Wall to Lumen Ratio (WLR)



Example of analysis results in metric units. Visual units are also available.

Mosaic

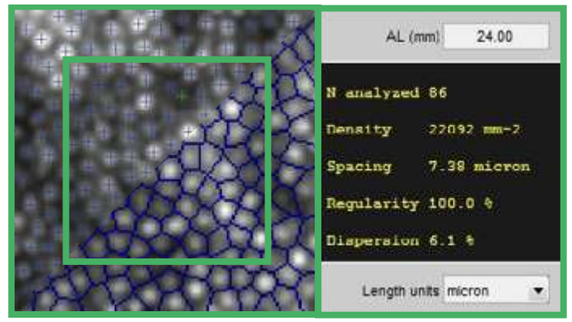
For images of parafoveal cone cells

Automated mosaic segmentation and Voronoi analysis

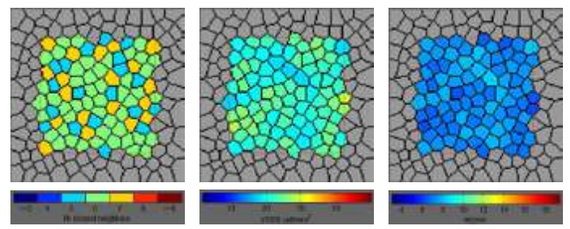
Manual correction : simple clicks to add and remove cells while monitoring the Voronoi segmentation

Mosaic descriptors
- Cell density
- Inter-cell spacing
- Regularity index
- Dispersion index

Color-coded Voronoi diagrams
- Regularity (left)
- Density (middle)
- Spacing (Right)



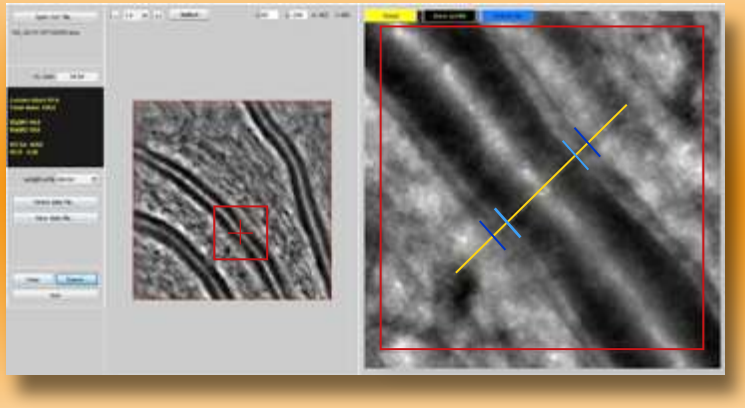
Example of analysis results in metric units. Visual units are also available for reduced variability in Voronoi cell density and inter-cell spacing[2].



AOdetect software is not part of the rtx1 product and is for research use only

[1] Rosenbaum et al. Imaging of retinal arteries with adaptative optics, feasibility and reproducibility. Ann Cardiol Angeiol (Paris) 2013; 62:184-188.
[2] Legras et al. Distribution of Cone Density, Spacing and Arrangement in Adult Healthy Retinas with Adaptive Optics Flood Illumination. PLOS ONE 13, e0191141.

AOdetect Walls interface



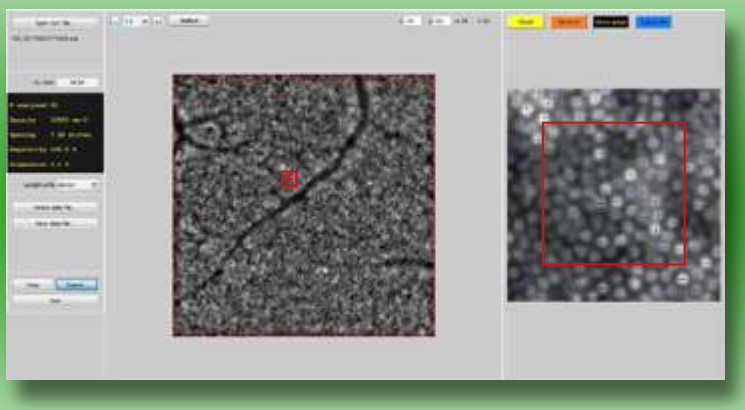
The retinal image analysis with rtx1 offers a novel noninvasive measurement of early changes in the vasculature that are not detectable on routine clinical examination.

Zaleska-Żmijewska et al. *Journal of Diabetes Research 2017*, 1–9

It could represent, in the near future, an evaluation to be performed in all hypertensive patients

Agabiti-Rosei et al. *Journal of Hypertension 35*, 914–921

AOdetect Mosaic interface



The AO images revealed that the parafoveal cone density was reduced even with good visual acuity at stages 1 and 2 of CACD.

Gocho et al. *Ophthalmic Surg Lasers Imaging Retina 47*, 1115-1126

In early MacTel 2 eyes with near-normal vision AO is able to show cone density loss in the macula, without loss of the ellipsoid zone on OCT.

Jacob et al. *Retina 36*, 545–551

SPECIFICATIONS

AOdetect Software

Computer requirements	
OS	Windows XP-SP3, Vista-SP2, 7-SP1, 8
RAM	2 Gbyte or more
CPU	Intel i3 or higher
Supported image files	
AOdetect™ Walls	rtx1™ images exported as PNG files
AOdetect™ Mosaic	rtx1™ images exported as PRE files
Export formats	
Analysis results	XLS, CSV spreadsheets
Segmentation	JPEG

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