RegionFinder
The perfect Use
SPECTRALIS HRA, HRA+OCT and
SPECTRALIS OCT bluepeak™

SPECTRALIS

HEIDELBERG ENGINEERING

RegionFinder – The perfect Use

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The RegionFinder provides a semi-automatic quantification of the area of a geographic atrophy based on Blue Laser Autofluorescence imaging that can be acquired by the SPECTRALIS product family or by a Heidelberg Retina Angiograph.

Starting the program

- Right-click the preview icon of an AF image.
- Select the *RegionFinder* function.

- An overview appears with all of the patient's AF images that can be aligned with the selected image.
- Possibly click an image to manually exclude it.
- Click OK to confirm your selection.

- Two windows appear on the Define Regions tab (left: original image, right: work area showing image with optimized contrast).
- Double-click the center of the atrophic area to fill a large section of it with color.
- Scroll the mouse wheel to enlarge or reduce the size of the automatically colored area.
- Evaluate the result on the Change Analysis tab.
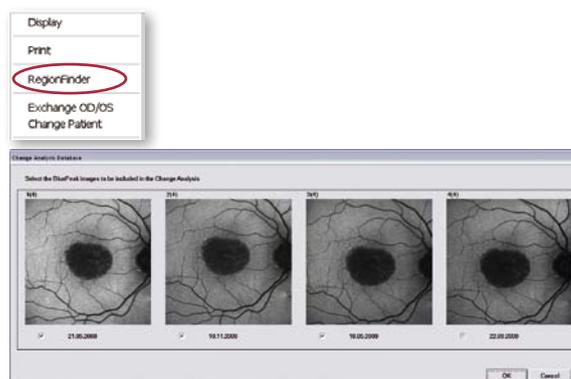
Activating the expert mode

In individual cases, it might be helpful to expand the basic functions of the RegionFinder.
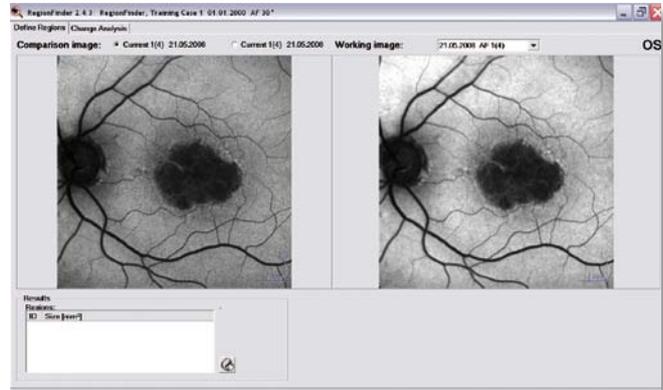
- Close RegionFinder.
- On the HEYEX interface, select the Setup menu.
- Select the Options function.
- Select the Plug Ins tab in the options box.
- Select the HSFRegFinder plug-in and click the Setup button to open the selection window.
- Select the check boxes to activate optional functions.
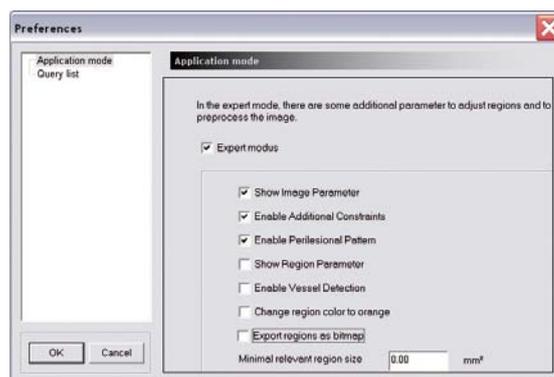
Measuring the atrophic areas (Define Regions)

When you confirm your image selection, the *Define Regions* tab opens. If several AF exams were performed and included in the selection, a second tab, *Change Analysis*, appears. The *Define Regions* tab contains all functions necessary for marking the atrophic areas.

Two similar images are displayed: the working image (right) and the comparison image (left). The RegionFinder automatically optimizes the working image for processing. The comparison image shows the original image or alternatively the image from the previous exam.

TIP: Press the Shift key to display the working image with the original contrast.

Double-click the center of the atrophic area to color a large section of it with the RegionFinder.

Expert mode activated!

The „Shadow function" allows you to brighten the darkened areas of the image by moving a slider. To do so, you must first activate the Image Parameters function.

⚠ This action will reduce the image sharpness!

You can change the size of the automatically colored area (Image 2) by scrolling the mouse wheel. The size of the colored area is displayed in mm² in the Results window below the comparison image. The optimal result is achieved when the color marking fills the sharply defined atrophic zone (Image 3).
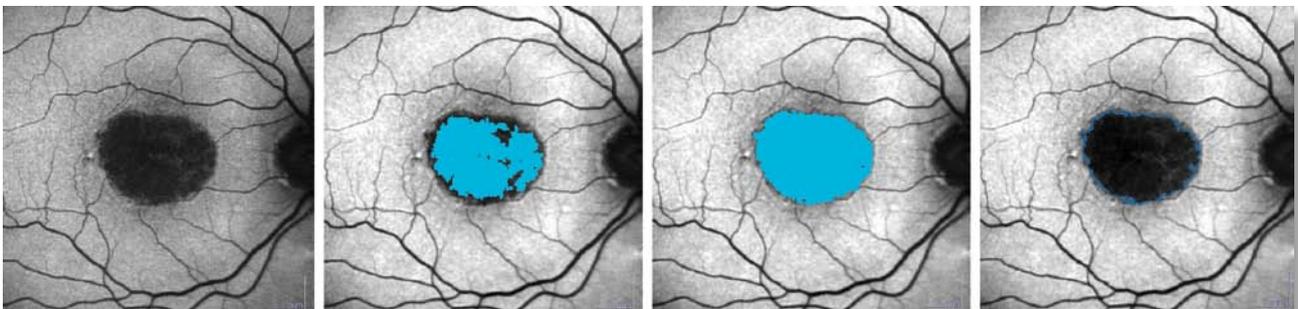
Image 1 *Image 2* *Image 3* *Image 4*

TIP: To check the boundary of the sharply defined atrophic area, you may find it helpful to press the Ctrl key on the keyboard to show only the edging of the atrophic area (Image 4).

In addition to atrophic areas, the blood vessels and the highly pigmented fovea show little to no autofluorescence. To restrict these areas from atrophic areas, you must set constraints.

The line (block: line) is suitable for restricting blood vessels, and the circle (block: circle) for restricting healthy areas.
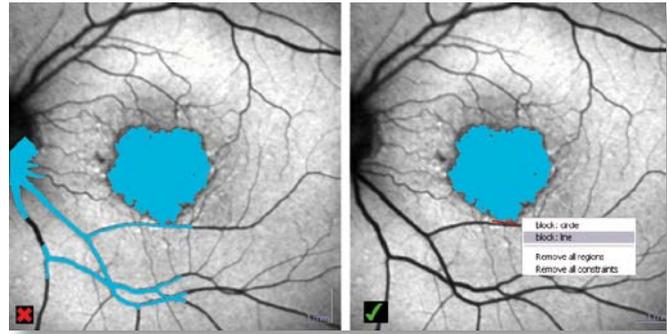
If the image is a pathology image with several atrophic areas, you can mark these areas in succession following the pattern described above.

You can remove incorrect fill effects and constraints. Right-click any region or any constraint to open the **Define Region** context menu. You can remove set constraints and regions with the *Remove constraint/Remove region/Remove all constraints/Remove all regions* functions.

You can significantly reduce the time needed to mark a follow-up exam, especially if a pathology image includes multiple atrophic areas and several constraints were necessary for the demarcation.

Use the Copy Region button to copy one or more regions as well as the set constraints from the previous exam.
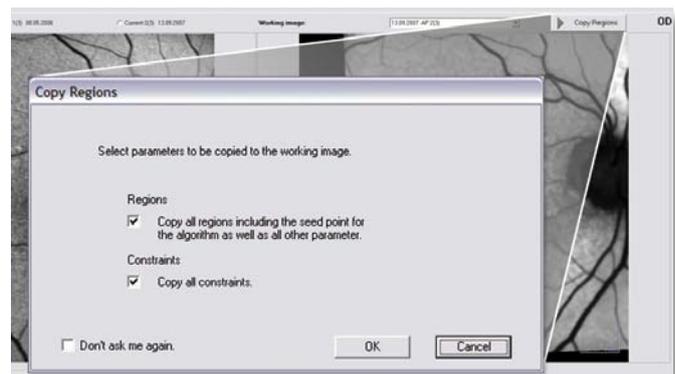
CAUTION: The *Copy Region* function does not transfer the absolute area, but only the gray value parameters that result in this area when calculated. Since the gray value distribution is not identical in any image, the colored area appears different for each follow-up exam and must be adapted using the mouse wheel.

Displaying the progression (Change Analysis)

The *Change Analysis* tab displays all of the results of a series of exams. You can define any image of the series as the reference image and compare the number and size of the regions directly with all subsequent images. You can very quickly toggle between the selected images in order to detect very slight changes.

Displayed parameters

- **Total Area:**
  This parameter shows the total area of all defined regions over time. The reference measurement is identified with a red triangle, and the follow-up exam being considered with a blue triangle.

- **Change from Reference:**
  This parameter shows the change of all defined areas in mm² in relation to the reference exam. The reference measurement is identified with a red triangle.

- **Change from Previous Examination:**
  Shows the increased atrophy of all defined areas in mm² in relation to the previous exam.

- **Rate of Change:**
 This graph visualizes the rate of growth of all defined atrophic areas in mm²/year.

- **Change Map:**
  This map graphically represents the differences between the defined areas of the reference exam and the defined areas of the follow-up exam. Any increase in the atrophic area in relation to the reference exam is shown in orange. Areas marked in green would indicate a decrease in size of the atrophic zone. This could be caused by an error in image alignment.

- **Progression Movie:**
  Creates a movie from all images of a series of exams. This function allows you to graphically demonstrate the progression of the atrophic areas.
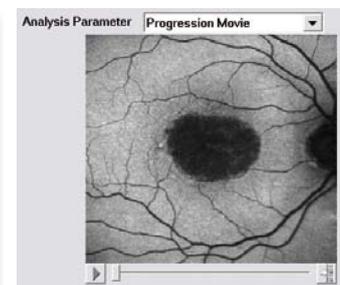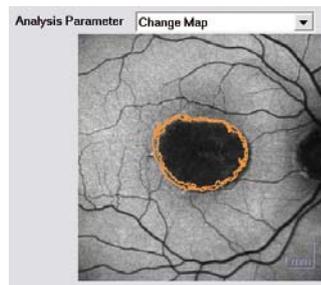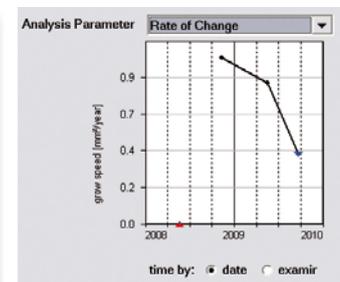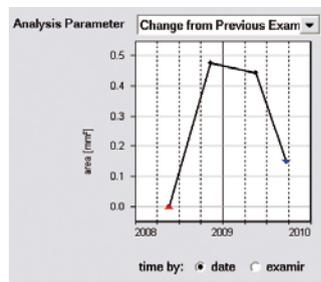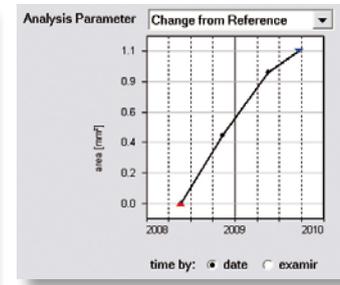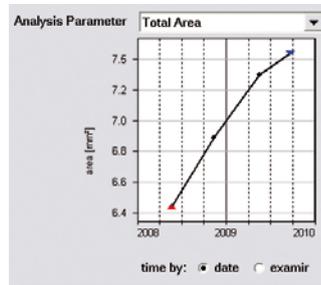
☞ **TIP:** You can choose between a timeline display and a display by examination number.

All parameters are also available as numerical data in the table below the diagram.

Analysis Summary

Date	No. Regions	Total Area [mm²]	Change from Reference [mm²]	Change from Previous Exam [mm²]	Rate of Change [mm²/year]
21.05.2008	1	6.430	0.000	-	-
10.11.2008	1	6.905	0.475	0.475	1.008
18.05.2009	1	7.348	0.918	0.443	0.855
22.09.2009	1	7.495	1.065	0.147	0.422

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