

ReLesSeg represents the software tools for automatic processing of retinal lesions from retinal images. To run this software, use the file *ReLesSeg.exe*. After running this file, an user is required to select a retinal image for the analysis. We added the folder *Retinal_Images*, which contain together 20 retinal images from the systems *Clarity RetCam 3* and *Icon PHOENIX*. Consequently, a pre-processed selected retinal image will appear. Here an user is supposed to specify the center of initial contour for the further segmentation. After this step, the segmentation process is being processed, where in predefined number of iterations the active contour adopts the morphological features of the selected retinal lesion. As soon as the segmentation process is over, user will receive the following results:

Graphical results:

- Native retinal image with the segmentation curve
- Comparison of native retinal image with segmentation result
- Histogram of intensity distribution of the selected retinal lesion from the segmentation model

Stored Results:

- Binary model of retinal lesion
- Native image
- Results of native and pre-processed images, binary segmentation model, and extracted features for lesion quantification.

All the stored results are provided in the MATLAB format (.mat). The complete results (Features_results) are stored in the MATLAB structure, which contains both data and data description.

In the folder, you will find the file: *Segmentation_Parameters.xlsx*, where an user defines the steering parameters for the segmentation:

- Number of iterations
- Kernel size of active contour
- Radius of initial contour

It is advantageous to set the radius close to the size of the analysed retinal lesion to prevent the effect of undersegmentation. An optimal number of iterations may differ for various size of individual lesions and the image resolution. For our testing, we used the radius between 10-20 and the number of iterations: 200-400. When selecting an excessive number of iterations, the segmentation process may have the tendency of oversegmentation, especially in the retinal lesions with weak image edges.

Software *ReLesSeg* was written and compiled in MATLAB 2021. To run this software, you should have at least the Runtime version 9.10.

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