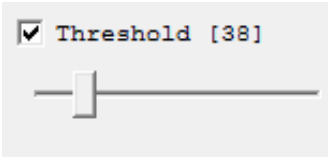
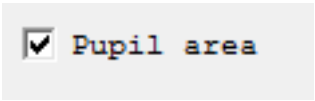
1. The threshold adjustments

This program determines a domain darker than the threshold to be a pupil. So the threshold adjustments are very important to detect pupil. You can use auto threshold adjustments but sometime fixed value will be better. If environment brightness is not changed while experiments, fixed value will be better. Please apply a trial-and-error and find a better mode.

If you use auto threshold adjustments, first, open 'Window->Option' and check 'Use previous data'. I recommend to check this parameter even if you do not use auto threshold adjustments. This parameter enables to detect a pupil by using a previous picture. When auto threshold adjustment goes wrong, the value determined manually is used. So you should adjust threshold manually first.

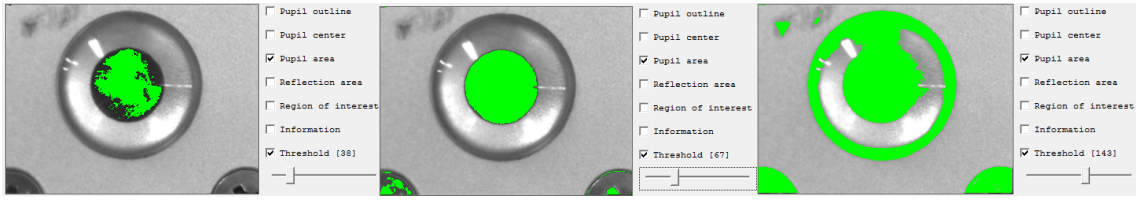


By selecting the check box of Threshold, the program uses fixed threshold value. The current threshold value is shown in a parenthesis(e.g. [38]).

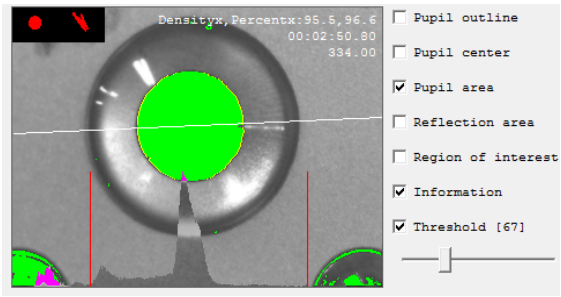


By selecting the check box of Pupil area, the program fills the area below a threshold with green. When you adjust threshold manually, you should check it.

By moving the Threshold slider, as shown in the following figures, the area below the threshold changes.



In the center figure the area darker than threshold equal to pupil area, it is the optimum value. If you use fixed threshold value, adjustment of the threshold is finished. If you use auto threshold adjustments then clear the check box of the Threshold. Select check box of Information, you can see the histogram of the image and the present threshold. The reversed domain is a histogram and the left red vertical bar indicates present threshold. The pupil corresponds to the first peak. So the optimum threshold is a bottom position next to the peak.



2. The illumination reflection threshold adjustments

By using illumination reflection to a cornea, a motion of a head is canceled. There is not auto threshold adjustments, so …