

Project 2

Segmentation. Develop an algorithm that allows you to find an iris (without a pupil) in the eye image.

following stages:

- Finding the pupil border.
- Finding the iris border.
- Splitting the iris into a rectangle (optional).



To determine the limits we need:

- Thresholding

$$P = \sum_{i=0}^{h-1} \sum_{j=0}^{w-1} \frac{A(i,j)}{h \cdot w}$$

P – binaryzation threshold

h – image height

w – image width

A(i,j) – gray value for gray-scale input image

Both thresholds are normalized independently:

- iris: $P_I = \frac{P}{X_I}$
- pupil: $P_P = \frac{P}{X_P}$

- Morphological operations: erosion, dilation. Make a suitable combination of erosion and dilation in each case.
- To determine the center we use vertical and horizontal projection of binary image (or in other directions). We are looking for maximum values in the different direction.

The iris in the form of a ring could be represented in the form of a rectangle. For this purpose, we must convert Cartesian coordinates to polar coordinates.