

Image segmentation and Edge Detection.

When the function first receives the image from the main function, it splits the RGB-image to 3 images, since there are 3 channels.

And the function will denoise each channel respectively by using gaussian mask with a standard deviation 2.

And then using $2 * 12$ gabors mask (which are phase 0, 90 and orientation from 0 to 165) to convolve each channel.

And the result of each channel is the square root of 12 pairs of square sums of convolution of 2 different phase gabor at each orientation and the one channel image.

Under this circumstance, using "same" convolution method makes the pixel value "abnormal" around the matrix. Therefore, the function set the pixel value around the matrix 0. (The information will not be too much around the image, that is to say this method is not totally brutal or risky).

Then, using a $3 * 3$ matrix to erode each image, in order to reduce the outlier pixel.

Then using a canny method to do the edge detection. Combine 3 channel after being done by canny edge detection. Turn the pixel value less than 2 to 0, else 1.

The 0-1 matrix is the result of the segmentation.

The accuracy on training sets is approximately 70%.