Report

First, binarize and downsample the image. Then do 7 iteration of calculating Yokoi connectivity for the image, marking the image and thinning the image.

Function `cal_connectivity(img)` will calculate Yokoi connectivity for the entire image, and return the matrix “connectivity”.

Function `mark(img, connectivity)` takes the image and its connectivity as input and return a matrix “mark_map”. For each pixel (r, c), if connectivity(r, c) == 1 or the number of 1 in 4 neighbors’ connectivity is 0, then set mark_map(r, c) to 0, else set to 1.

Function `thinning(img, mark_map)` takes the image and its mark_map as input and return thinned image. For each pixel (r, c), if mark_map(r, c) == 1 and the Yokoi connectivity of (r, c) in the current image equals to 1, then set img(r, c) to 0.