

Exam: Stochastic watershed

1 Stochastic Watershed

The algorithm of the stochastic watershed to segment an image I can be summarized by the following steps:

1. Generate n random points from a Poisson point process.
2. Use these points as markers and perform a constrained watershed on the image I .
3. Repeat m times these first two steps.
4. Evaluate the probability density function (the use of `ksdensity` can be considered) of these m realizations.
5. Segment the obtained pdf via a classical watershed.



Code a matlab function that takes 3 arguments: n , m and I , and returns the segmented image.

2 Open question

A serie of corneal images is given in addition to a manual segmentation (Fig. 1).



- Apply the previous segmentation algorithm on these images.

The drawback of this segmentation algorithm is the choice of n .



Propose a method in order to evaluate the best n and m . The optimal segmentation is available from the campus website.

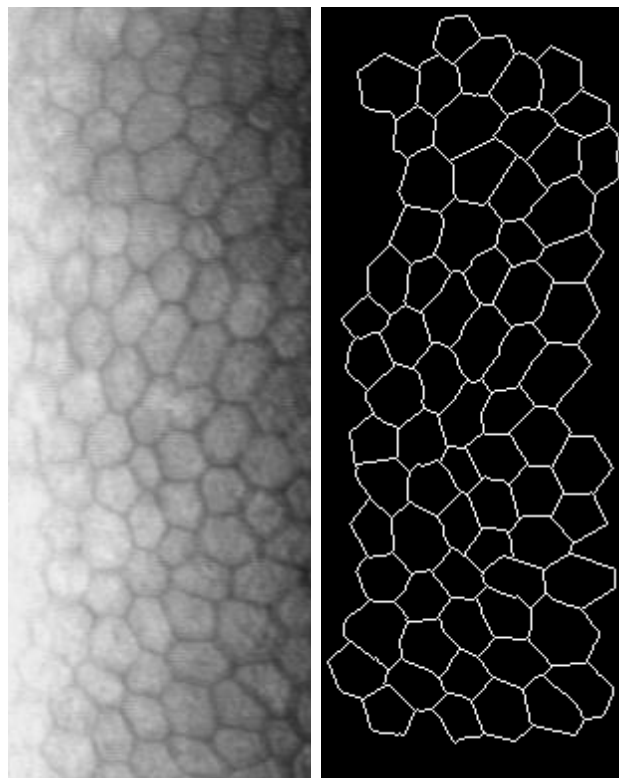


Figure 1: Human corneal endothelium in specular microscopy and manual segmentation of the cells.