

How to complete any segmentation process interactively via Image Foresting Transform

- How to import automatic results obtained from external processes and complete their segmentation interactively?
- How to continue a previous segmentation obtained by the same interactive tool when crucial data (e.g., the history of user input) are no longer available?
- We present solutions to all these problems under the framework of the “Image Foresting Transform” (IFT).



Image Segmentation Using Component Tree and Normalized Cut

- Image segmentation based on the Normalized Cut technique applied to a hierarchical image representation, the Component Tree
- The Component Tree has been proven effective in many applications of image segmentation. Its implementation is relatively simple and the number of nodes and edges is lower than when using other graph representations



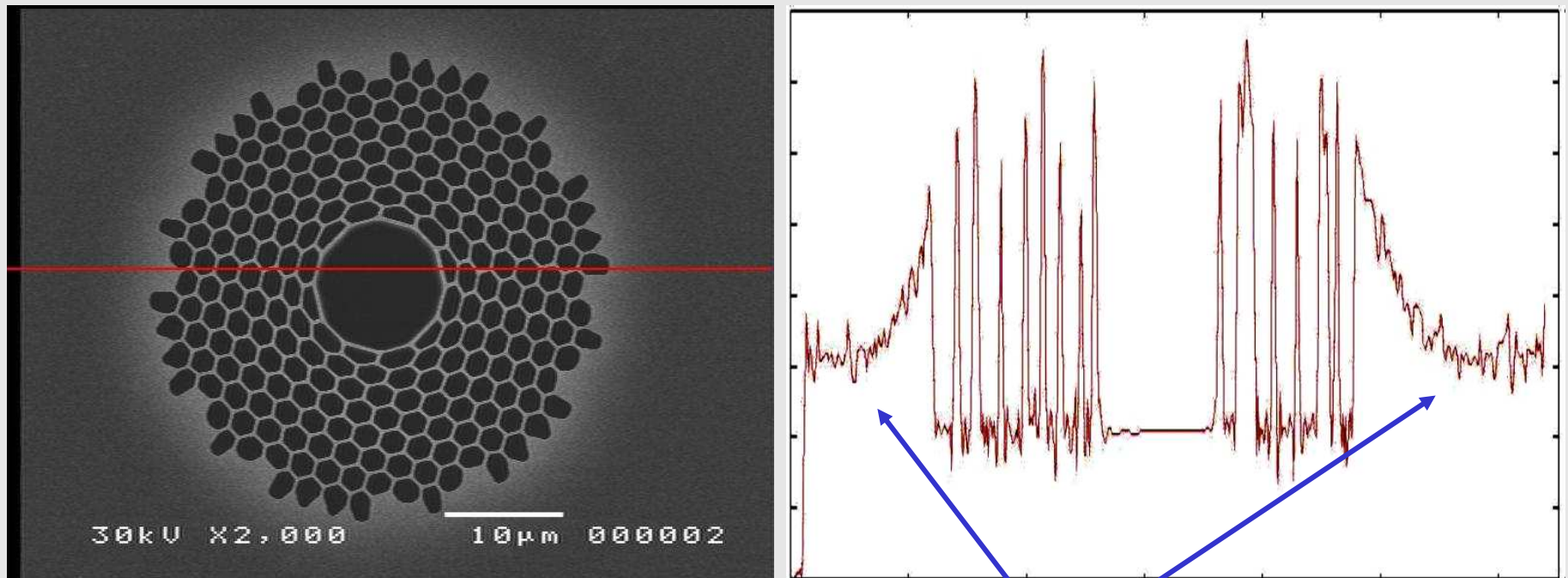
Image Segmentation Using Component Tree and Normalized Cut

- Our approach was compared with three other formulations: (i) grid pixels affinity; (ii) graph based on watershed transform; and (iii) a multiscale graph decomposition;
- In general, experiments shown that the CT segmentation approach produces better or equivalent results than the other approaches.

PyFibers: contour extraction of photonic crystal fibers

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Objective: to properly segment holes in SEM images of cross section of photonic crystal fibers



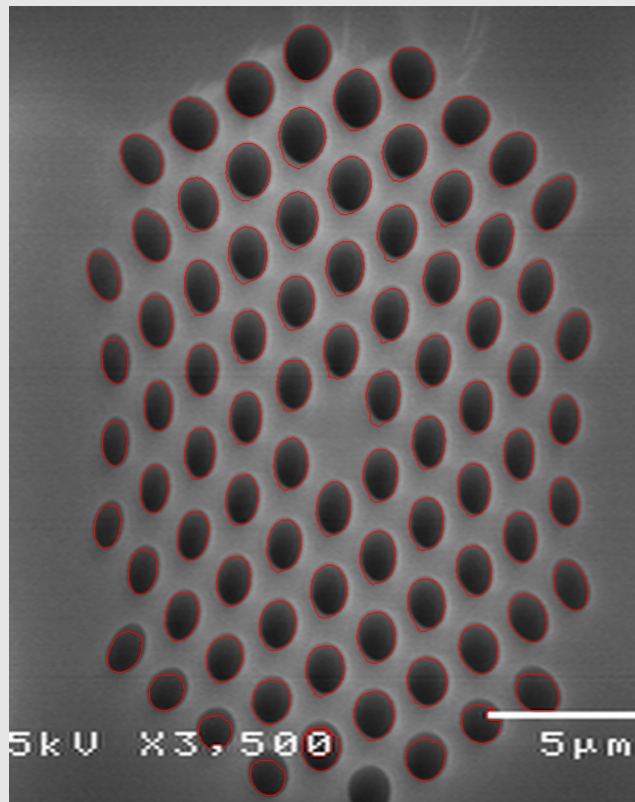
Problem: gray level gradient around fiber

PyFibers: contour extraction of photonic crystal fibers

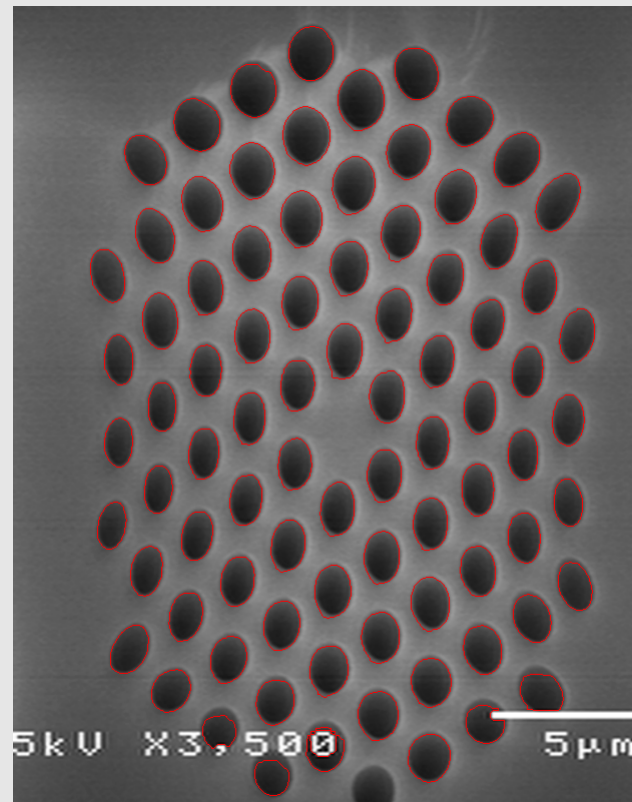
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Tools: mathematical morphology

Results:

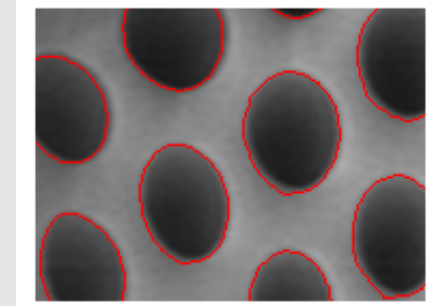
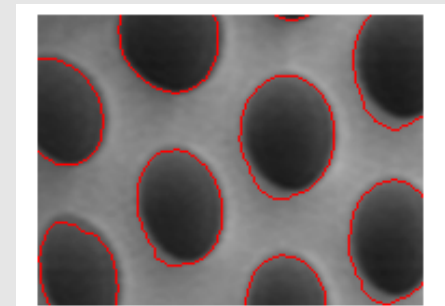


automatic



semi-automatic

automatic



semi-automatic

Segmentation and classification of histological images - application of graph analysis and machine learning methods

- The measurements obtained from image and graph analysis were fed into Support Vector Machine (SVM) algorithm, which were designed and developed to automatically learn to recognize complex patterns and make intelligent decisions based on data.

- The results show that the methodology was successful in characterizing and classifying the differences between the architectural organization of epithelial and adipose tissues.
- Other result, although the areas of adipose cells are generally larger than the areas of epithelial cells, this measure does not allow a direct differentiation among them. Moreover, the best result occurred when a neighborhood relationship between vertices within graphs was considered.