

Micrographic Image Segmentation using Level Set Model based on Possibilistic C-Means Clustering

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Abstract: Image segmentation is often required as a fundamental stage in microstructure material characterization. The objective of this work is to choose hybridization between the Level Set method and the clustering approach in order to extract the characteristics of the materials from the segmentation result of the micrographic images. More specifically, the proposed approach contains two successive necessary stages. The first one consists in the application of possibilistic c-means clustering approach (PCM) to get the various classes of the original image. The second stage is based on using the result of the clustering approach i.e. one class among the three existing classes (which interests us) as an initial contour of the level set method to extract the boundaries of interest region. The main purpose of using the result of the PCM algorithm as initial step of the level set method is to enhance and facilitate the work of the latter. Our experimental results on real micrographic images show that the proposed segmentation method can extract successfully the interest region according to the chosen class and confirm its efficiency for segmenting micrographic images of materials.

Keywords : Level set, clustering approach, micrographic images, image segmentation.