Abstract

A critical and important stage in microstructure image analysis is segmentation, because the segmentation method has direct impact on the end results of analysis. The main aim of this paper is to determine appropriate segmentation method for microstructure image analysis and quantification. In this work, some popular segmentation methods, namely, Otsu’s automatic threshold, watershed, uni-grid active contour method and multi-grid active contour methods have been investigated. The reliability of the segmentation methods is tested by determining the volume fraction of phases present in microstructure images of materials of known chemical composition. The experimentation is done using microstructure images of cast iron of various compositions. The experimental results are compared with expected values of volume fraction. The active contour multi-grid segmentation model is found to yield better results within the practical limits as compared to manual and other automated methods.
Reference

Index Terms

Computer Science 

Image Processing

Key words

phase of material
microstructure
metallograph
knowledge-base
volume

fraction
watershed
active contour