

Analysis of Binarization Techniques in Morphology-Based Scatterer Calculation

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The roughness characteristic of an organ surface is a key indicator for examining the finalities of that organ. There are traditional roughness calculation methods based on measurements using the stylus technique (contact system) which causes damages to the organ surface. However, compared to these traditional techniques, roughness calculations based on image processing have shown promising results with higher accuracy. This paper proposes a technique on binary image-based morphological processing to calculate the roughness. Microscopic images of sandpapers were used as raw images and they were converted into binary images using binarization techniques such as Otsu's thresholding, adaptive thresholding, Bernsen thresholding, Niblack Thresholding, and Bradley thresholding. Further, the scatterer size and number of scatterers of the images were calculated by morphological processing. Accordingly, histograms were plotted (X-axis - the size of the scatterer, Y-axis - the number of scatterers in each size) for each image. The histograms were compared using statistical parameters (skewness, kurtosis, variance, and mean) to identify the best binarization technique. Otsu's method has shown positive results in scatterer calculation than other techniques.

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