

DENOISING HISTOLOGICAL IMAGES FOR A BETTER COLOUR
IMAGE SEGMENTATION

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ABSTRACT

De-noising can be generally defined as removing noise in image. According to (Pierrick Coupe et.al, 2008), image de-noising is used to improve the accuracy of various image processing algorithms such as registration or segmentation. Generally, the quality of the artifact correction influences performance of the image processing procedure. So, the noise removal aims at improving the image quality for visual inspection. The preservation of relevant image information is important especially in medical context. The problem statements of the study have been defined as the problem of noise, the problem of colour image segmentation and the problem of conventional method in preparing histological images for analysis. In order to achieve better colour for image segmentation, the objectives of the study have to fulfill first which is to perform de-noising on colour histological images, then to perform colour image segmentation on histological images and finally to evaluate the effect of denoising on colour image segmentation. In this study, the de-noising concept for colour image preprocessing and segmentation are proposed since these two processes has been widely accepted as an important component of the image mining in order to enhance the images. Haar Wavelet transform is selected as the method for doing de-noising of the histological colour images in pre-processing step. Wavelet transforming has the advantage of multi-resolution in both time domains as well as in frequency domain, so it can be used to describe the partial characteristics for both domains. The reasons of doing the de-noising is to enhance the histological image prior to image segmentation as the accuracy of segmentation is heavily dependent on the pre-processed image. Then the images are used in providing steadfast data for image segmentation using Karhunen-Loeve and Otsu algorithm. Segmentation results are then evaluated using quantitative analysis, which is peak signal-to-noise ratio (PSNR). This methods is used to compare systematically to identify whether the images (with or without denoising) gives an effect on colour image segmentation. Outcome from the experimental test shows that enhancement of histological image using de-noising for a better colour image segmentation. Therefore, the outcome will benefit the pathologies to assist them in analysis and diagnosis of the histological images. It helps improve the performance in term of time and accuracy to analyze the histological image compared to traditional method which is time consuming and less accurate.

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