

Analysis of the performance of SLIC super-pixel toward pre-segmentation of soil-transmitted helminth

Abstract

Soil-Transmitted Helminth (STH) infections are one of the most severe health issues in the world including Malaysia and frequently happened in an unsanitary environment within the children group. The helminth infections are diagnosed by inspecting the faeces samples manually through light microscope. However, the manual inspection method to diagnose the helminth egg is a time-consuming and challenging process especially when are huge number of samples. To increase the efficiency and accuracy of the diagnosis, an analysis of super-pixel segmentation with different parameter adjustments on four different species was carried out. This work described a Simple Linear Iterative Clustering (SLIC) super-pixel algorithm that uses different parameter settings to explore more parasites image features for a better segmentation process in the future and to analyse the effect of different SLIC parameter settings towards the pre-segmentation process. There is total 80 images collected from the four helminth egg species which are *Ascaris Lumbricoides* Ova (ALO), *Enterobius Vermicularis* Ova (EVO), Hookworm Ova (HWO) and *Trichuris Trichiura* Ova (TTO). The proposed approach is divided into three steps. First, the images with various lighting conditions are enhanced by the partial contrast stretching (PCS) technique. The simple linear iterative clustering (SLIC) super-pixel algorithm was implemented to the enhanced images as a pre-segmentation algorithm to form super-pixel images. Lastly, image quality assessment will be performed on the SLIC images. The SLIC parameter compactness of super-pixel, m of 5 and number of super-pixels, k of 1000 was selected because they generate the greatest PSNR value, indicating that this combination of parameters could produce high-quality images. In future, a more in-depth analysis of the parameter k and m , which impacts the form of each super-pixel and the pre-segmentation process, might improve the recommended approach.