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Image segmentation using k-means clustering and otsu's thresholding with classification method for human intestinal parasites

Abstract

Helminth is one of the intestinal parasites that may cause harm and death to human. It is very important to have a system that is capable of assisting the technologist in investigating of fecal samples. In this paper, an automatic classification process is proposed to detect the different types of helminth eggs from fecal samples by using image processing technique. 50 samples of Ascaris Lumbricoides Ova (ALO) and Trichuris Trichiura Ova (TTO) are tested. First, these images undergo partial contrast stretching (PCS) technique to enhance the target images. Next, RGB and HSV color model have been compared in order to identify which color component is able to ease the segmentation process. S component shows a good results with high contrast between the target and the unwanted region. Then, Otsu's thresholding and k-means clustering are compared in order to to select the most suitable image processing method to be used in classification procedure. k-means clustering shows a better results compared to Otsu's thresholding. In classification process, area and size have been chosen as the feature to extract for the classification. The ratio for successfully detected ALO species is 84% while TTO is 76%.