

Unsupervised Segmentation Technique for Acute Leukemia Cells Using Clustering Algorithms

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Abstract : Leukaemia is a blood cancer disease that contributes to the increment of mortality rate in Malaysia each year. There are two main categories for leukaemia, which are acute and chronic leukaemia. The production and development of acute leukaemia cells occurs rapidly and uncontrollable. Therefore, if the identification of acute leukaemia cells could be done fast and effectively, proper treatment and medicine could be delivered. Due to the requirement of prompt and accurate diagnosis of leukaemia, the current study has proposed unsupervised pixel segmentation based on clustering algorithm in order to obtain a fully segmented abnormal white blood cell (blast) in acute leukaemia image. In order to obtain the segmented blast, the current study proposed three clustering algorithms which are k-means, fuzzy c-means and moving k-means algorithms have been applied on the saturation component image. Then, median filter and seeded region growing area extraction algorithms have been applied, to smooth the region of segmented blast and to remove the large unwanted regions from the image, respectively. Comparisons among the three clustering algorithms are made in order to measure the performance of each clustering algorithm on segmenting the blast area. Based on the good sensitivity value that has been obtained, the results indicate that moving k-means clustering algorithm has successfully produced the fully segmented blast region in acute leukaemia image. Hence, indicating that the resultant images could be helpful to haematologists for further analysis of acute leukaemia.

Keywords : acute leukaemia images, clustering algorithms, image segmentation, moving k-means

Conference Title : ICCISE 2015 : International Conference on Computer, Communication and Information Sciences, and Engineering

Conference Location : Jeddah, Saudi Arabia

Conference Dates : January 26-27, 2015