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Detection of tuberculosis bacilli in tissue slide images using HMLP network trained by Extreme Learning Machine

Abstract

This paper proposes an automated detection of tuberculosis bacilli in Ziehl-Neelsen-stained tissue slides using image processing and neural network. Image segmentation using CY-based colour filter and k-mean clustering procedure is used to separate objects of interest from the background. A number of geometrical features are then extracted from the segmented images. A recent training algorithm called Extreme Learning Machine (ELM) is modified to train a hybrid multilayered perceptron network (HMLP) for the classification task. The results indicate that the performance of HMLP-ELM network is comparable to the previously proposed methods and offers a fast training time with no designing parameter required. Ill. 6, bibl. 15, tabl. 1 (in English; abstracts in English and Lithuanian).

Keywords

Tuberculosis bacilli; Hybrid multilayered perceptron network (HMLP); Tissue slides image; Extreme Learning Machine (ELM)