Abstract

Malaria being one of the serious health burdens especially in Indian population is conventionally diagnosed by expert pathologists through microscopic observation of stained peripheral blood smears. In order to provide rapid and efficient healthcare support to the common people at rural areas where experts are not (often) available, there is indeed a requirement of developing web-enabled healthcare system. In view of this, in this study, a web-accessible framework for automated storage of compressed microscopic images and texture-based screening of malaria parasite has been developed to provide rapid and efficient diagnosis even at remote public health clinics. It consists of (a) automated storage of microscopic images followed by JPEG image compression for faster transmission; (b) watershed transform based erythrocyte segmentation followed by image preprocessing; (c) texture feature extraction and selection; and
(d) supervised classification and validation. Here, total 76 textures are extracted from segmented erythrocytes. Twenty six significant features are selected by using SVM based recursive feature elimination (SVM-RFE) method. Thereafter, supervised classifiers viz. Naïve Baye’s approach, C4.5 and NBTree are considered for six-class classification problem and their performance are compared. From the result, it has been found that NBTree classifier provides higher accuracy to classify P. vivax and P. falciparum (sensitivity: 99.0%, specificity: 99.8%) with different stages viz. ring, gametocytes and scizon under our developed web-accessible framework.

References

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**Index Terms**

Computer Science  
Artificial Intelligence

**Keywords**

Web application  
J2EE platform  
Compression  
JPEG  
Malaria Screening  
Texture Feature Extraction  
Classification