

A Comparative Study for Various Techniques Using WEKA for Red Blood Cells Classification

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Abstract : Red blood cells (RBC) are the most common types of blood cells and are the most intensively studied in cell biology. The lack of RBCs is a condition in which the amount of hemoglobin level is lower than normal and is referred to as "anemia". Abnormalities in RBCs will affect the exchange of oxygen. This paper presents a comparative study for various techniques for classifying the red blood cells as normal, or abnormal (anemic) using WEKA. WEKA is an open source consists of different machine learning algorithms for data mining applications. The algorithm tested are Radial Basis Function neural network, Support vector machine, and K-Nearest Neighbors algorithm. Two sets of combined features were utilized for classification of blood cells images. The first set, exclusively consist of geometrical features, was used to identify whether the tested blood cell has a spherical shape or non-spherical cells. While the second set, consist mainly of textural features was used to recognize the types of the spherical cells. We have provided an evaluation based on applying these classification methods to our RBCs image dataset which were obtained from Serdang Hospital-Malaysia, and measuring the accuracy of test results. The best achieved classification rates are 97%, 98%, and 79% for Support vector machines, Radial Basis Function neural network, and K-Nearest Neighbors algorithm respectively

Keywords : red blood cells, classification, radial basis function neural networks, support vector machine, k-nearest neighbors algorithm

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