

While the best results
that is with



While 8 they developed a system called Leuko and they use consistency information to increase differences among leukocytes. They used textural parameters built on gray level occurrence matrices (GLCM) that are energy, inertia, homogeneity and correlation. Feature selection is very important in developing Leuko system that is data reduction can be done so that classification algorithms can learn quickly and accurately. Classifier can standardize better from available data, results are easier to understand as well as reduce the time. 23 In this research they built a system to identify the leukemia cell by using bone marrow images. The system was constructed by using Support Vector Machine (SVM) classifier and exploit characteristics in blood cell images that allied to texture, geometry and statistical analysis. They stress on generation and selection of features to get the best recognition.

Textural parameters that have been used are mean value, angular second moment, contrast and entropy. Geometrical parameters are radius, perimeter, area, filled area, compactness, concavity, concavity points and symmetry. While parameters for statistical analysis are mean value and standard deviation for nucleus and cytoplasm, mean and standard deviation for gradient matrix, skewness and kurtosis for image and gradient matrix. Error of training data is 11.87%, errors of testing data is 21.13%.

They just select 30 best features and this produce error of training data to 13.07% and errors of testing data to 18.71%. 10 Used modified k nearest neighbor (KNN) to classify malaria parasite for microscopic images of blood cell and the results are so good with error 0.01%. 7 Then, they use artificial neural network 3 layers and 4 layers to identify malaria and thalassemia.

They use microscopic images of blood cells and apply image processing technique for e.

g. image enhancement, edge erosion, color, size normalizing and many more. They found out that artificial neural network with 3 layers give the best results that is with error $2.7454e(-0.005)$ and rate of correct classification is 86.54%.

12 Used EM-Algorithm to recognize types of leukocyte. First, the image pattern is changed into a lower dimensional space by using principal component analysis. EM-algorithm is used to get the parameters of the Gaussian functions to model the probability distribution function of each class of cells. The images are classified by getting the class conditional densities using Bayes' theorem. Classification is done by choosing the class with the highest probability.

18 Have detected ALL by using fractal features that is hands-off dimension to classify a lymphocytic cell into normal lymphocyte or lymphoblast. 18 Also used fuzzy based segmentation technique to extract WBC nucleus from blood microscope images using color based clustering. At the end, they use SVM to classify. The accuracy of 93% was observed.

19 Used global contrast stretching to enhance the images. By performing this, the visual detail of blast cells can be increased and they do the segmentation based on HSI color space. There are many day by applications in medical images that use reinforcement learning. 9 And 20 have used reinforcement learning (RL) in their work. They use RL in order to overcome some problems in medical images. Medical images have very similar

graylevel and texture among the interested objects. Segmentation error may occur and increase.

Another problem is may be lack of a sufficient number of training samples if a supervised learning technique is employed. By approaching RL