ABSTRACT

The Thyroid were placed in human throat could be freely abnormal which is difficult to detect early. There are two kind of thyroid disease. They are Hypothyroid and Hyperthyroid. Those two will cause serious effect to human body if they are not detected early. Hypothyroid will causes idiot syndrome, hyperthyroid will causes giant cell, tumor and cancer.

Doctors do conventional disease detection from Thyroid sample. Old researches still using visual detection by microscope. In order to make it more effective than before, they need to create a computer system that could automatically and fast detect the thyroid disease from the picture of blood sample. The system that can be analyzed and accuracy proved.

This paper tells us about two simulated digital picture processing systems to detect thyroid disease with two different kind of picture detection method, there are LVQ (Learning Vector Quantization) and DT (Decision Three). Those methods use in each Matlab programming systems with parameters. LVQ system got optimized result with used Learning Rate 0.00375, 20000 times Epoch, and 8 Hidden Layer as parameter's combination. DT have own optimized parameter's combination, they are WS = 12, C = 0.02, R = 9. The step of Digital picture processing could start from picture acquisition, noise reduction, broad threshold determination, until picture ready to detect.

Finally, those two methods were appealed in computation time and estimation accuracy. The result of simulation shows that the accuracy of LVQ method with 99.31% better than DT method with 98.27%. In learning computation process LVQ took faster period than DT, but took longer period than DT in final testing process. In average of learning process JST LVQ needs 0.008 seconds of 90 images, but Decision Tree needs 1.120 second. In average of testing process of 200 images JST LVQ needs 1.541 seconds, it is longer than Decision Tree which only needs 0.180 seconds.

Keyword : Thyroid, Patology Anatomy, LVQ, DT, Image Analysis