ABSTRACT

This research is about detection on dental *periapical* cyst and normal teeth through *dental periapical radiograph* image using *Countourlet* Transformation and LVQ (*Learning Vector Quantization)* Artificial Neural Network. In fact, a doctor can detect disease of human dental through *rontgen X-ray* result but in its development cannot eliminate allegation (*suspect*).

Detection system in a dental disease is designed consisted of three parts of the system, namely: *pre-processing*, feature extraction, and classification. The *Pre-processing* aims to improve the quality of the input image using *imadjust (contrast stretching)* and the *median filter*. Feature extraction aims to take the feature vector of an image which would then be classified. While the classification aims to classify the image into two conditions which are normal and *periapical* cysts using LVQ (*Learning Vector Quantization)* Artificial Neural Networks.

The accuracy of this system is 100% for 22 training images. Accuracy of testing images is 85.37% for the 41 testing images. The best parameters of the process that is followed by a resize 512x512 and resize 256x256, imadjust *(contrast stretching)* in the range 50-250, median filter with 5x5 window, *Contourlet* Transformation with *subband* 1,2,3,4, and LVQ (*Learning Vector Quantization)* Artificial Neural Network with a value of *mean* of the hidden neurons, epochs, and the goal (MSE) in the amount of 50, 100, 0001.

Keywords: *periapical* cyst, *imadjust (contrast stretching)*, *median filter*, *contourlet* transformation, LVQ (*learning vector quantization*) artificial neural network.