

ABSTRACT

Natural resources on earth is essential for human life, one of them is rock. Rocks is formed naturally by one or several types of minerals. Minerals is an elements or chemical combination which occurred naturally. Mineral also as a constituent of rocks in the components of the foundation of the earth and its crust. There are so many types of rocks, but it can be grouped into 3 basic types such as volcanic rocks, sedimentary rocks, and rocks deform (metamorphic).

Nowadays, an expert geologist has the limitations of analyzing the mineralogy in the rocks. So, in this Final Project the author will make a software based on digital image. This will help to identified and classified in analyzing the texture and also percentage of minerals color in the rock which focused on igneous rock. The stage is about digital image acquisition which then implemented preprocessing and feature extraction to be able to identify the type of rock. The feature extraction method is using Gabor Wavelet with Linear Discriminant Analysis (LDA) classification.

In this Final Project, the outhor has choose the best microscopic images to testing with a total of 240 nicol cross images and 168 parallel nikol images. The comparative of training data and test data used is 70:30. The result of the research can be concluded that the combination of Gabor Wavelet parameters with orientation direction and frequency level has no great effect on accuracy. The application of Gabor Wavelet method and LDA classification in identifying microscopic type of igneous rocks has reached 80.57% accuracy for cross nikol, while for nikol parallel the accuracy rate reached 73.33%.

Keywords: *Types of Rocks, Mineral, Digital Image, Gabor Wavelet, Linear Discriminant Analysis*