

ABSTRACT

Rock consists of three types, namely igneous rocks, sedimentary rocks, and metamorphic rocks. In the crust layers, most of the layers are composed of igneous rocks and metamorphic rocks, whereas sedimentary rocks are generally present on the surface of the earth's crust. This makes the petrological experts should be able to identify the rocks in accordance with the characteristics of these rocks. But to be able to identify and determine what mineral components are contained in rocks, especially igneous rocks, these petrological experts still do so in a conventional manner equipped with the science they possess. This is the background of the topic This final task is the classification of any mineral found in igneous rocks including andesite rocks, basalt rocks, and granite rocks.

The ability of the system in this research can help petrologists to identify what mineral content is present in igneous rocks, so it can be a precise standard of accuracy. In this final project, has been discussed about digital image processing techniques for mineral classification in igneous rock that can be done by using certain methods that can recognize the object. In this final project, the writer uses Histogram of Oriented Gradient (HOG) extraction method and Linear Discriminant Analysis (LDA) classification starting with preprocessing process, feature extraction, and classification of igneous rock.

From the test results obtained the accuracy of the system. By using Histogram of Oriented Gradient extraction method with block dimension size = 2, the accuracy value of 79.12% for parallel image and accuracy is 73.99% for cross image image of nikol.

Keywords: *Igneous Rock, Histogram of Oriented Gradient, Linear Discriminant Analysis*