ABSTRACT

Granulomas are a chronic periapical disorder of the necrotic pulp of human teeth. These disorders attack the root of the tooth. Granulomas appear as a form of immunity or defense of the body due to an infection of the tooth. Infected pulp tissue can become the site of bacterial nesting, causing granuloma to form, an exaggerated granulational tissue in response to the form of infection of the tooth.

Diagnosis obtained from the results of anamnesis (interview) and physical examination to the patient is uncertain, so it needs investigation in the form of periapical radiograph where the results of x-ray will be diagnosed by radiologist. However, the interpretations by radiologist may vary from one doctor to anothers. Therefore, it needs a way that can help doctors to make the diagnosis.

This research is done by digital image processing technique to facilitate granuloma diagnosis. The image identification process begins with a pre-processing process, followed by feature extraction using the Histogram of Oriented Gradients (HOG) method. HOG is a feature or method used for the edges or local shape information of an unknown image with a clear gradient value and the edge position. Then end with the classification process using K-Nearest Neighbor (KNN) method.

This research is a development of previous research with different methods. In this final project the system can classify the granuloma tooth condition or non-granuloma tooth and produces the best performance value with 83,33% accuracy and computation time 0.6074 *second. It is also hoped that the ability of this system can provide a diagnosis of support for health experts in providing appropriate decisions and treatment of patients.*

Keywords ***:*** *Granuloma, Periapical Radiograph, Histogram of Oriented Gradients (HOG), K-Nearest Neighbor (KNN)*