Identification of Chronic Periodontitis Disease in Dental Panoramic image by Line Strength and Line Tracking Algorithm

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ABSTRACT

Chronic periodontitis is an inflammatory disease or infection in periodontal tissues. In the medical field, a quick and accurate detection of disease is very necessary. But in fact, many of the previous studies are still on difficulties in doing so.

This research developed a computer-aided system to identify chronic periodontitis disease on dental panoramic radiographs using line strength and line tracking algorithms. Detection process began by using the line strength algorithms to detect patterns of lines on the image. Line tracking was done as the integration process of sampling the maximum value of strength at all levels of image results, namely by tracking each pixel and do an assessment by providing confidence values for each pixel on a certain scale. After that, the process of maps quantization to form a pattern of lines based on the confidence value of each pixel in the image results. From the results of that image, a new bone density calculation can be done to find out whether someone is suffering from chronic periodontitis disease or normal.

Experiment was obtained from collaboration with the Institute of Tropical Diseases (ITD) Airlangga University. The data consisted of 20 images of dental panoramic radiographs with clinical identification which has been done by a specialist dentist. The test results achieved best accuracy value of 95%, sensitivity of 100%, and specificity of 50%.

Key Word : Line Strength, Line Tracking, Chronic Periodontitis, Dental Panoramic Radiographs.