

UNIVERSITY TEKNOLOGI MARA

**CONTRAST ENHANCEMENT TECHNIQUE TO
IMPROVE VISUALISATION OF WOODEN AND
GRAPHITE FOREIGN BODIES IN SOFT TISSUE
COMPUTED RADIOGRAPHY**

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**Project submitted in partial of the requirement for the degree
of Bachelor of Medical Imaging (Hons.)**

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AUTHOR'S DECLARATION

I hereby declare that the work presented in this research project thesis entitled Contrast Enhancement Technique to Improve Visualisation of Wooden and Graphite Foreign Bodies in Soft Tissue Computed Radiography was carried out in accordance with the rules set by MARA University of Technology (UiTM). It is the result of the original research, unless otherwise indicated or acknowledged as referenced work. I also had read and understood the policies and procedures of the course set by the UiTM before I completed this research.

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ABSTRACT

Purpose: This paper evaluates the ability of contrast limited adaptive histogram equalization (CLAHE) using Image J software to improve the visibility of wooden and graphite foreign bodies in soft tissue.

Methods: The wooden and graphite were selected as foreign bodies with different dimension. Wooden and graphite foreign body were embedded in jelly which has density equivalent to the soft tissue. The jellies have different thickness to simulate density of different extremities. The wooden and graphite were selected due to wide availability, frequency and appropriate size for accidental intrusion of foreign body. Computed radiography images of embedded foreign body were obtained. Ten radiographer blinded to number of object were ask to count number of wooden and graphite foreign body visible in CLAHE images and general post processing images. This study going to test limited adaptive histogram equalization (CLAHE) ability by comparing number of foreign body visualize in CLAHE images to general post processing image.

Result: The test result show visualization of wooden and graphite foreign body using contrast enhancement technique (CLAHE) has significant different compared to general post processing technique in computed radiography ($p < 0.05$).

Conclusion: This study showed the contrast limited adaptive histogram equalization (CLAHE) technique using ImageJ was better on the visualisation of wooden and graphite in the soft tissue compared to the general post processing technique.

Keyword: Contrast Limited Adaptive Histogram Equalization (CLAHE), Foreign body, Wooden, Graphite, ImageJ, Contrast Enhancement

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