

**SEGMENTATION OF LYMPHOMA ON CT SCANS
USING IMAGE PROCESSING TECHNIQUES**

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Abstract

Advancement of image processing techniques in computers has encouraged the potential use of Artificial Intelligence (AI) in various diagnostic medical imaging procedures leading to early detection, diagnosis, surveillance, and treatment response. In this research, the concept of Image Processing has been used to develop a medical image analysis method to measure the maximum diameter of the malignant lymph nodes of Lymphoma patients with the use of Computed Tomography (CT) images. This study is based on 10 CT scan images collected from a retrospective data collection of five lymphoma patients admitted to Kandy Teaching hospital. The segmentation is performed using OpenCV libraries according to the following steps; manually placing the seed point, determining the external marker, Canny edge detector, morphological operations, dual-thresholding and, watershed algorithm. Afterthat, the maximum diameter (LDi) is determined using Euclidean distance. The results obtained was evaluated with the professionals. SPSS 26 statistical software is used to conduct a paired T-test at 95% confidence interval to determine the accuracy of the LDi values of the manually and semi-automatically segmented lymph nodes. According to the results, there is no significance between the manually and semi-automated segmentation ($P = 0.596 > 0.05$). Thus, the developed semi-automated segmentation tool is helpful for the medical clinicians to easily assess lymphoma patients in their day to day work. As a future implication, the proposed study could be developed in to a fully automated segmentation tool with the use of a prospective data collection to avoid the subjectivity and reduce the time consumed in assessing patients.

Keywords: Image processing, Lymphoma , Computed tomography, OpenCV