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**Automatic Segmentation and Automatic Seed Point Selection of Nasopharyngeal Carcinoma from Microscopy Images Using Region Growing Based Approach**

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**ABSTRACT**
**Context**: Nasopharyngeal carcinoma (NPC) is a type of cancer in the head and neck, and this cancer presents in the throat region between the pharynx and nasal cavity. NPC is frequently detected in Southeast Asia, particularly in the southern part of China, Malaysia, Singapore, Hong Kong, Taiwan, Vietnam, and Thailand. **Problem**: The diagnostic procedure of NPC entirely depends on the Physicians experience and involves multiple subjective decisions. Subjective decision-making can result in inter and intra observer variations. Inter-observer variation is the total difference obtained from the results of two and above observers when scrutinizing similar materials. Variation amongst the observers is the total difference an observer experience when spotting the same material many times. Tradition diagnostic of NPC has many limitations such as the time consuming for doctors to identify and recognize the tumour area slice by slice and reduce radiologists' workloads. In addition, another challenge lies in the appearance of doctors used the observation of human eyes (human errors) in NPC cases can be missed detailed information. **Approach**: A novel approach to Automatic Segmentation plus initial seed generated without human intervention of Nasopharyngeal Carcinoma Using Region Growing Based Technique from microscopy images is presented in this study by take advantage of geometric features to detection of NPC images. In order to get accurate region of NPC image, the proposed results utilize wavelet transform for image enhancement by reduce the noise by remove the high ratio sub-bands and predestine a developed NPC image. Segmentation steps including many phases. Firstly, the Thresholding is mean value used to binarise the image and secondly, filtering or remove unwanted objects in the images. **Finding:** The findings outcome from this study have shown that: (1) A new adaptive threshold is used as a post-processing to at long last detect the NPC; (2) Identified and established an evaluation criterion for Automatic Segmentation of NPC cases; (3) Highlight the methods, based on region growing based technique and active contour operation, for selecting the best region; (4) assessed the performance of the proposed results by comparing the manual measurements and automatic NPC Segmentation. The NPC segmentation rate in the technique used is about 83.89%. Comparably, this amount expanded to 92.04% once a line presumption (NPC approximation) was utilized in one of the stage in the technique here.

**Index Terms—Nasopharyngeal Carcinoma, Image Segmentation, Automatic Segmentation, Automatic Seed Point Selection, Microscopy Images, Region Growing Based Technique**

## 1. Introduction
The systems of Medical imagine exhibit an important part in contemporary medical problems solutions via utilizing automated and quasi-automated techniques of conducting image examination by means of large amounts of precisions and speeds. A number of imagery machines are available and are utilized in diagnosing sicknesses in human, like the examination of tumour. What the gadget targeted at is producing an image of the inside organ of the human body in such an exactitude and