

An executive summary of the final report of the work done on the Minor Research Project of **Nausheeda B S**, entitled “**CELL NUCLEUS SEGMENTATION OF SKIN TUMOR USING IMAGE PROCESSING**”, sanctioned by UGC, vide sanction letter no **MRPS(S)-0510/13-14/KAMA002/UGC-SWRO** dated **28th March 2014**.

Executive Summary of the report

Skin tumor - a malignant tumor that grows in skin cells is one of the most common of all human tumor and in the present-days, accounts for more than 50% of all types of tumor around the world. Skin tumor (also known as “skin neoplasm”) is skin’s unwanted growth with differing causes and varying degrees of malignancies. It can spread very fast to all organs/parts of human body through lymphatic system or blood. The incidences of “melanoma - the deadliest form of skin tumor has been on rise at an alarming rate of 3% per year. Detection of malignant melanoma in its early stages considerably reduces morbidity and mortality. Skin tumor can be cured at very high rates with simple and economical treatments. For the benefit of human race, there is a need of diagnosis of skin tumor at an early stage and lots of researchers already working in that direction by means of hardware and software development using different techniques. In this regards, supposed to use images of tumor affected skin of patients frequently.

In this work of cell nucleus representation of skin tumor, collected 20 tumorous and also 20 non-tumorous images from various hospitals in and around Karnataka and Kerala. These images were preprocessed using the description given in chapter 3 which resulted in enhanced image. The steps followed for this process has been depicted in Fig 1

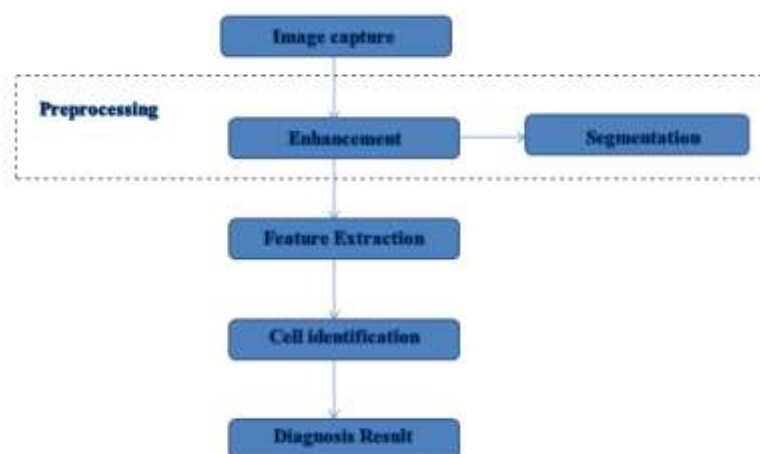


Fig 1: Steps followed for process of segmentation

The enhanced images were subsequently processed in the segmentation module where the exact nuclear region was obtained. For segmentation of nuclear region, 40 results are obtained using various combinations of color spaces and clustering using FCM and K-means from which the best is chosen. The segmentation result along with clustering technique, color space, color channels used and corresponding weight. The best segmentation results were followed to the feature extraction stage.

The segmented image is used to extract features such as texture, color and shape. Some of important properties (or descriptors) of the texture are coarseness, smoothness, regularity, and of the color are light rate, medium rate, dark rate, while the common shape descriptors are length, breadth, aspect ratio, area, location, parameter, compactness.

ABCD rule of dermatoscopy was applied for the extraction. ABCD represent in Asymmetry, Border structure, Color variation and Dermatoscopic structure. The extracted features were used to identify the tumorous and non-tumorous cells.

Achievements from the project

Performed comparison between two methods of clustering.

Contribution to the Society

This method will help to segment the cell nucleus of skin infected with tumor and to further study by the doctors.