

Assignment-2

Digital Image Processing (Fall 2020)

Submission deadline: 03 Jan 2021

Skin Lesion Segmentation

Dermoscopy imaging is used for analysis of skin lesions. There are three major types: Atypical Nevus, Common Nevus and Melanoma. You have already used this dataset in your 1st assignment. It is available at <https://drive.google.com/drive/folders/1IWRrrCFR3NrdU7RL6rTK3HIJnV044iY-?usp=sharing> . Now you are also given ground truth for each image.

In this assignment you have to implement different algorithms for skin lesion segmentation. Apply following algorithms to segment lesion from all images in dataset

1. Adaptive thresholding
2. K-means clustering on Colored dermoscopic images
3. Combination of different techniques you have studied so far (up to you. Use your learning in an efficient way)

You have to test each algorithm on all images and then find performance parameter DICE Coefficient as given in equation below.

Here, True positive (TP) is the number of true positive (pixels that actually belong to lesion according to ground truth and you have also extracted it as lesion) and false positive (FP) is false positives (pixels that don't belong to lesion according to ground truth but detected wrongly as lesions by algorithm you have implemented)

$$Dice\ Coefficient = \frac{2 * TP}{FN + (2 * TP) + FP}$$

You need to do followings

1. Upload your whole code in text form on LMS
2. Make a report and upload its pdf containing a table for whole dataset mentioning each image with respective performance parameter value and average values in last row of table for each method you have applied
3. Make a flow diagram of your algorithm and add in the report.

Note: Submissions are on LMS only. Submit code in text form and report in pdf form.