Software Engineering

User Guide

Project – 24
Microstructure-Segmentation

1. **Steps to run the project:**

1. Install the necessary packages using pip OR create a conda environment

    - torch 1.2.0
    - torchvision 0.2.2
    - scikit-image 0.15.0
    - pytorch 1.1.0
    - pillow 6.0.0
    - python 3.6.8
    - numpy 1.16.3
    - matplotlib 3.1.0
    - opencv
    - matplotlib

2. Navigate to the Final_Code folder

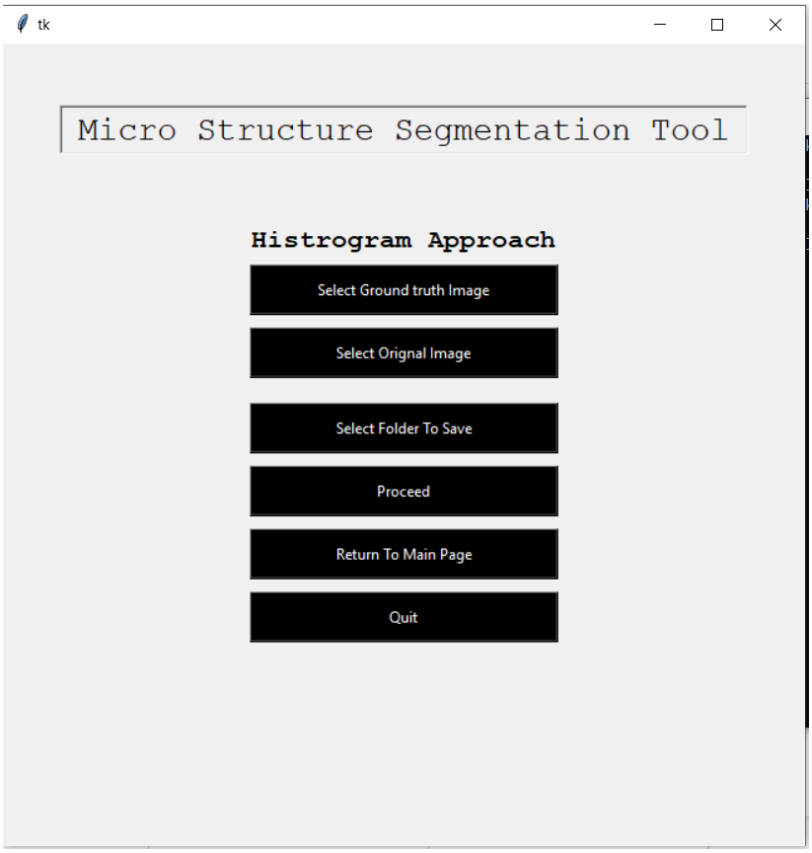
3. Launch the command prompt OR the conda environment (if you have created any)

4. Run the script Microstructure_segmentation.py using the command:

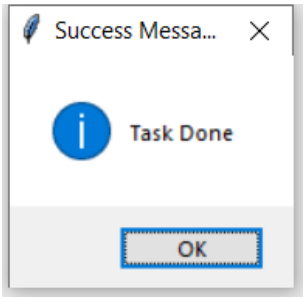
    python Microstructure_segmentation.py .

2. How to use the Microstructure -Segmentation tool

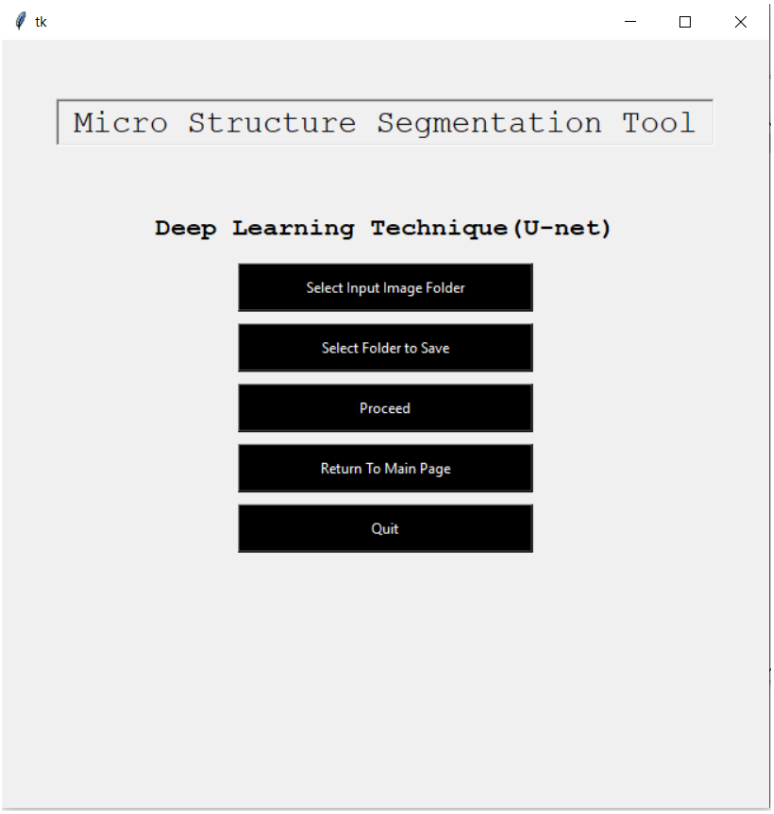
1. **Image Processing Technique (Histogram approach):**



- To run this, one must first execute step 3 to generate sub-images of size 256x256.
- We have provided 5 sample images in the **HistogramInput** folder.
- Select one ground truth image from **HistogramInput/GroundTruthImages** folder.
- Select one corresponding id original image from **HistogramInput/OrignalImages** folder**.**
- Select the folder where you want to save the output image.
- Click on proceed Button
- After completion, the application provides a notification that the task is done



2. Deep Learning Technique (UNET approach):



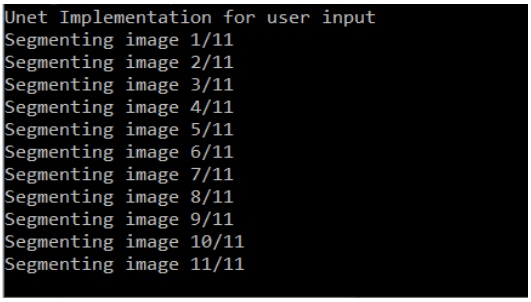
- Click on Select Input Image Folder to select the folder containing all the image files for segmentation.

  (Note: This technique is designed to perform segmentation on multiple images at once. Hence, the folder containing the image file/files must be provided as input. This technique reads all images present in the input folder. The images must be of size 256x256) We have provided 5 sample images in the **UnetInput** folder.

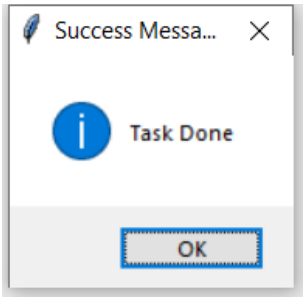
- Click on Select Folder to Save to browse through your computer and specify the folder where the segmented images can be stored.

- Next, hit Proceed to start the segmentation process.

- You may refer to the log showing the number of input images processed. This is displayed on command prompt for the application



- After completion, the application provides a notification that the task is done



3. **Make samples from image:**

   Owing to data confidentiality, we cannot provide the main image that was used to create sub-images. However, you can check the working of this module by selecting **.tif** image.

4. **Click “Quit” to close the application**