Advanced Image Processing (IT507)

Assignment 2

February 19, 2022

1 Instructions

- Implement the following problems in Python or MATLAB.
- **Do not copy code from any source.**
- Prepare a report(one report per group).
- Submit the report (PDF format) in the Google classroom within the deadline.
- The assignments will be evaluated on Monday from 5:30 PM to 7:30 PM.

2 Problems

1. Consider Fig.1 and remove the larger object from the image. *[Hint: Create a mask and apply*

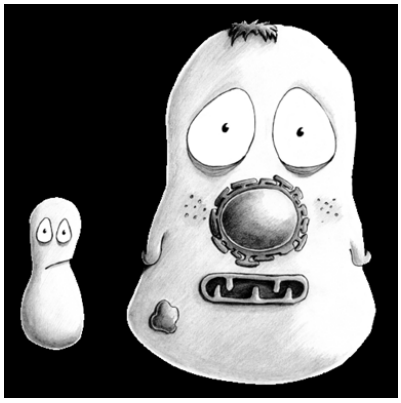

Figure 1

arithmetic operation].

2. Consider Fig.2, and find out whether the person has moved his hand from (a) to (b). You can find out the percentage of change in pixels between them. Can you solve problem with any other method?

3. Load the image shown in Fig.3. Examine the distinct intensity levels that the image has. Consider each of the intensity levels as random variable, and compute the probabilities of each of the intensity level. Plot the computed probabilities with respect to the the intensity levels. Now, add constant value 100 with the image of Fig.3, and plot the probabilities with respect to the the intensity levels. Observe the difference between two plots. What kind of arithmetic operation on the image would shift the probability distribution towards the left? If you down-sample the given image by a factor 2, and plot the probability distribution – what will happen? Explain your observation.

(a) (b)

Figure 2

Figure 3

4. Implement an algorithm to find out the numberplate of Fig.4(a) within the image (Fig. 4(b)).

(a) (b)

Figure 4

[Hint: Use the image matching algorithm and find out the normalized cross-correlation for each pixel].