ID# 13794 25/06/20

Muhammad Zarak Khan

DIGITAL IMAGE PROCESSING

Q1) What is Grey level Slicing? Explain in your own words with suitable example.

Ans: **Grey Level Slicing:**

Grey level Slicing is equivalent to band pass filtering. It manipulates group of intensity levels in an image up to specific range by diminishing rest or by leaving them alone.

This transformation is applicable in medical images and satelite images such as X-ray flaws, & CT scan. Two different approaches are adopted for grey level scaling.

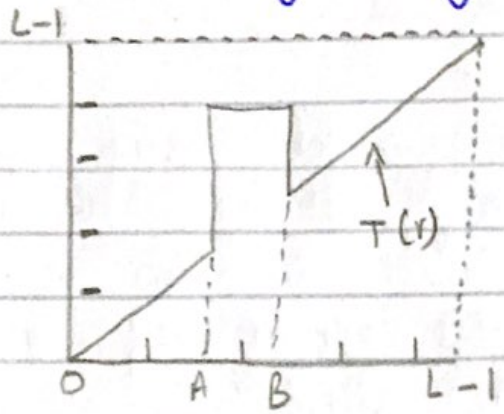
1) Grey level Slicing without backgrounds:

It displays high values in the specific region of an image and low value to other regions by ignoring backgrounds.

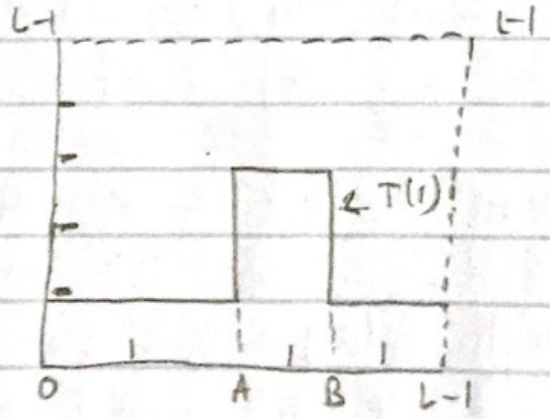
2) Grey level Slicing with background:

highlights range A by preserving all levels

It is displays high values in specific region of an image and original grey level to other region by preserving background



Ex 1)



Application of Grey level Slicing:

- Medical imaging where automatic contrast enhansment and sharpening is needed such as X-rays, Digital mamography, CT scan
- It brightens the dusk & dawn viewing
- Improves images for fog & sand storm enviro.

Q1 b) Is it possible to get additional details in the Negative of a picture? Justify your answer with example.

Ans: Well it depends if you have enough details in the negative area, dynamic range concept. If you do not enhance maybe with multiple software e.g Lightroom, by picking up the shadows, If details are not there then there's a point where grains are formed, Hence loosing image information.

For example dynamic Range

For example if we are taking picture from inside the cave taking picture of outside we want to expose the outside from inside the cave cave should be completely black ie no details then we use multiple things like HDR (high dynamic Range) we expose different pictures from outside & inside both cave & outside area is exposed.

Q2) Consider the picture

The image ----- what enhancement technique might be applied to get this technique.

Ans. Okay so this enhancement can be done in multiple softwares like lightroom or Adobe photo shop but lightroom is much better in this the shadows are up when we

enhance the shadows the details in the image if already present starts to arise if the details are present. If there is complete black in the image and complete white then there's no details present as long we have details that can come out with shadows.
It is called dynamic range If our image comes in dynamic range then that picture can be enhanced like this skeleton image the details were present in the dynamic range thus enhancing the image with shadows.

23) Find the following for the points 'p' & "q" given on grid.

$P = (6, 1)$ & $Q = (3, 7)$

- Euclidean distance
$= [(i-n)^2 + (j-m)^2]^{1/2}$
$[(7-1)^2 + (3-6)^2]^{1/2}$
$[(6)^2 + (-3)^2]^{1/2}$
$= \sqrt{36+9}$
$= \sqrt{36} + \sqrt{9}$
$= 6+3$
$= 9$

C.B.D:-

$= |i-n| + |j-m|$

$= |7-1| + |3-6|$

$= |6| + |-3|$

$= 6+3$

$= 9$

Ch.B.D:

$\max [|i-n|, |j-m|]$

$= \max [|7-1|, |3-6|]$

$= \max [6, 3]$

Q4) What does a Histograms of an image shows? How is it useful for processing for an image.

Ans: An image histogram is a type of

histogram that acts as a graphical representation of the tonal distribution in a digital image.

It plots the number of pixels for each tonal value. By looking at the histogram for a specific image a viewer will be able to judge the entire tonal distribution at a glance.

Image editors creats the histogram of the image being edited. The histogram plots the number of pixels in the image (vertical axis) with a particular brightness of a tonal valye. Algorithms in the digital editor allow the user to visually adjust the brightness value of each pixel and to dynamically display the results as adjustments are made.

Q4 B) 1) pic a matches hgm 2

2) Pic b matches hgm 4
3) pic c matches hgm 3
4) pic d matches hgm 1