**SVKM’s NMIMS**

**Mukesh Patel School of Technology Management & Engineering**

**Subject: Image Processing & Video Processing Program: B.Tech**

**Sem: V ACAY: 2024-25**

**EXPERIMENT NO. 2**

**Aim:**

1. To understand and implement image enhancement techniques-

Task- For the given test image, apply the following

* 1. Image negative (Linear transformation)
  2. thresholding
  3. Power law transformation with 5 different values of gamma.

b. For the given test image apply contrast stretching point processing techniques to enhance

the image.

**Software:** PYTHON

**Prerequisite:**

|  |  |
| --- | --- |
| Sr. No | Concepts |
| 1. | Basic understanding of image processing techniques |

**Outcome:**

After successful completion of this experiment, students will be able to

1. Strengthen understanding of basics of image processing concepts

2. Understand and implement the image enhancement using point processing

**Theory:**

**Point processing in spatial domain:**

All the processing done on the pixel values. Point processing operations take the form.

s = T ( r ) , T is referred to as a grey level transformation function or a point processing operation, s refers to the processed image pixel value and r refers to the original image pixel value

**Image Negative**

s = (L-1) – r , where L= number of grey levels

**Thresholding**

s=L-1 for r > threshold

s= 0 for r < threshold

**Grey level slicing without background**

s= L-1 for a < r < b, here a and b define some specific range of grey level

s= 0 otherwise.

**Grey level slicing with background**

s= L-1 for a < r < b, here a and b define some specific range of grey level

s= r otherwise.

**Power-law (gamma) transformation:**

Power-law (gamma) transformationscan be mathematically expressed as. 

Gamma correction is important for displaying images on a screen correctly, to prevent bleaching or darkening of images when viewed from different types of monitors with different display settings. This is done because our eyes perceive images in a gamma-shaped curve, whereas cameras capture images in a linear fashion. Below is the Python code to apply gamma correction.

**TO BE COMPLETED BY STUDENTS**

Students must upload the soft copy of the program in the given format.

|  |
| --- |
| Name of the Experiment |
| Roll No. Name: |
| Program Semester : |
| Date of Performance: Date of Submission: |

**Software Code written by student:**

**Input and Output:**

**Conclusion:**