

Faculty of Engineering and Technology

Department of Information and Communication Technology

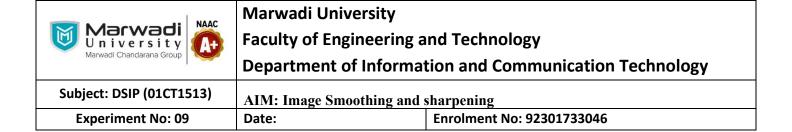
Subject: DSIP (01CT1513)

AIM: Image Smoothing and sharpening

Experiment No: 09 Date: Enrolment No: 92301733046

write a python program to simulate smoothening and sharpening operation on image using spatial filter

```
import cv2
import numpy as np
from google.colab.patches import cv2 imshow
# Load the image
image = cv2.imread('/content/smoothening data.png')
# Define the Gaussian kernel for smoothing
kernel size = (5, 5)
sigma = 1.5
gaussian_kernel = cv2.getGaussianKernel(kernel_size[0], sigma)
gaussian kernel = np.outer(gaussian kernel, gaussian kernel)
# Apply Gaussian smoothing
smoothed image = cv2.filter2D(image, -1, gaussian kernel)
# Define a sharpening kernel
sharpening kernel = np.array([[-1, -1, -1],
                              [-1, 9, -1],
                              [-1, -1, -1]
# Apply sharpening
sharpened image = cv2.filter2D(image, -1, sharpening kernel)
# Display the original image, smoothed, and sharpened images
cv2 imshow(image)
cv2 imshow(smoothed image)
cv2 imshow(sharpened image)
cv2.waitKey(0)
cv2.destroyAllWindows()
```







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write a python program to simulate smoothening using Averaging linear filters

```
import cv2
import numpy as np
from google.colab.patches import cv2_imshow
# Load the image
image = cv2.imread('/content/smoothening data.png')
# Define the size of the Averaging filter kernel
kernel size = (5, 5) # You can adjust the size based on the desired
smoothing level
# Create the Averaging filter kernel
kernel = np.ones(kernel size, dtype=np.float32) / (kernel size[0] *
kernel_size[1])
# Apply the Averaging filter for smoothing
smoothed_image = cv2.filter2D(image, -1, kernel)
# Display the original and smoothed images
cv2 imshow(image)
cv2 imshow(smoothed image)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

output:





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write a python program to simulate smoothening using median filters

```
import cv2
import numpy as np
from google.colab.patches import cv2_imshow

# Load the image
image = cv2.imread('/content/smoothening data.png')

# Define the size of the median filter kernel (should be an odd number)
kernel_size = 5  # You can adjust the size

# Apply the Median filter for smoothing
smoothed_image = cv2.medianBlur(image, kernel_size)

# Display the original and smoothed images using cv2_imshow
cv2_imshow(image)
cv2 imshow(smoothed image)
```

Output:





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AIM: Image Smoothing and sharpening

Experiment No: 09 Date: Enrolment No: 92301733046

write a python program to simulate sharpening using spatial high pass filters

```
import cv2
import numpy as np
from google.colab.patches import cv2 imshow
# Load the image
image = cv2.imread('/content/smoothening data.png')
# Apply Gaussian smoothing to reduce noise (optional but recommended)
blurred image = cv2.GaussianBlur(image, (5, 5), 0)
# Create a Laplacian kernel for sharpening
laplacian kernel = np.array([[0, -1, 0],
                             [-1, 5, -1],
                             [0, -1, 0]], dtype=np.float32)
# Apply the Laplacian filter for sharpening
sharpened_image = cv2.filter2D(blurred_image, -1, laplacian_kernel)
# Display the original image, blurred image, and sharpened image
cv2_imshow(image)
cv2 imshow(blurred image)
cv2 imshow(sharpened image)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

output:

