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MV Assignment 1

1. Implement basic image manipulation and enhancement techniques using Python.

import cv2

import numpy as np

# Load image

img = cv2.imread('C:\\Users\\anujk\\Desktop\\New\_Start\\MV assignments\\1\\image.jpg')

# Resize image

resized\_img = cv2.resize(img, (300, 300))

# Convert to grayscale

gray\_img = cv2.cvtColor(img, cv2.COLOR\_BGR2GRAY)

# Increase brightness

bright\_img = cv2.convertScaleAbs(img, alpha=1.2, beta=50)

# Alpha controls contrast, beta controls brightness

# Save output

cv2.imwrite('resized\_image.jpg', resized\_img)

cv2.imwrite('gray\_image.jpg', gray\_img)

cv2.imwrite('bright\_image.jpg', bright\_img)

Original Image

A large elephant and baby elephant

Description automatically generated

Resized Image

A large elephant and baby elephant

Description automatically generated

Gray Image

A baby elephant and adult elephant

Description automatically generated

Bright Image



1. Study and Implement advanced Image Manipulation and Enhancement techniques like Image Sharpening, Edge Enhancement, Noise Removal, Image Restoration, adding text and Watermarking in an image using python.

import cv2

import numpy as np

# Load image

img = cv2.imread('C:\\Users\\anujk\\Desktop\\New\_Start\\MV assignments\\2\\image.jpg')

# Sharpen image using a kernel

kernel = np.array([[0, -1, 0], [-1, 5, -1], [0, -1, 0]])

sharpened\_img = cv2.filter2D(img, -1, kernel)

# Noise removal using Gaussian Blur

denoised\_img = cv2.GaussianBlur(img, (5, 5), 0)

# Add text watermark

watermarked\_img = img.copy()

cv2.putText(watermarked\_img, 'Watermark', (40, 30), cv2.FONT\_HERSHEY\_SIMPLEX, 1, (0, 0, 0), 2)

# Save output

cv2.imwrite('sharpened\_image.jpg', sharpened\_img)

cv2.imwrite('denoised\_image.jpg', denoised\_img)

cv2.imwrite('watermarked\_image.jpg', watermarked\_img)

Original Image

A red notebook with spiral bound

Description automatically generated

Sharpened Image

A red notebook with spiral bound

Description automatically generated

Denoised Image

A red spiral notebook with a spiral bound

Description automatically generated

Watermarked Image

A red notebook with spiral bound

Description automatically generated

1. Study and Implement advanced Image Manipulation and Enhancement techniques like Image Sharpening, Edge Enhancement, Noise Removal, Image Restoration, adding text and Watermarking in an image using python.

import cv2

import numpy as np

# Load image

img = cv2.imread("C:\\Users\\anujk\\Desktop\\New\_Start\\MV assignments\\3\\image.jpg")

# Translation

rows, cols = img.shape[:2]

M\_translate = np.float32([[1, 0, 50], [0, 1, 100]])  # Shift by 50, 100

translated\_img = cv2.warpAffine(img, M\_translate, (cols, rows))

# Rotation

M\_rotate = cv2.getRotationMatrix2D((cols / 2, rows / 2), 45, 1)  # 45 degrees

rotated\_img = cv2.warpAffine(img, M\_rotate, (cols, rows))

# Scaling

scaled\_img = cv2.resize(img, None, fx=1.5, fy=1.5)

# Shearing

M\_shear = np.float32([[1, 0.5, 0], [0.5, 1, 0]])

sheared\_img = cv2.warpAffine(img, M\_shear, (int(cols \* 1.5), int(rows \* 1.5)))

# Flip horizontally

flipped\_img = cv2.flip(img, 1)

# Affine transformation

pts1 = np.float32([[50, 50], [200, 50], [50, 200]])

pts2 = np.float32([[10, 100], [200, 50], [100, 250]])

M\_affine = cv2.getAffineTransform(pts1, pts2)

affine\_img = cv2.warpAffine(img, M\_affine, (cols, rows))

# Save output

cv2.imwrite('translated\_img.jpg', translated\_img)

cv2.imwrite('rotated\_img.jpg', rotated\_img)

cv2.imwrite('scaled\_img.jpg', scaled\_img)

cv2.imwrite('sheared\_img.jpg', sheared\_img)

cv2.imwrite('flipped\_img.jpg', flipped\_img)

cv2.imwrite('affine\_img.jpg', affine\_img)

Original Image

A city skyline with a body of water

Description automatically generated

Rotated Image

A city skyline with a body of water

Description automatically generated

Scaled Image

A city skyline with a body of water

Description automatically generated

Sheared Image

A close-up of a city

Description automatically generated

Flipped Image

A city skyline with a body of water

Description automatically generated

Affine Image

A city skyline with many tall buildings

Description automatically generated