BAHRIA UNIVERSITY, ISLAMABAD
Department of Computer Science

CEN 444
Digital Image Processing
Lab Journal 13

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Title: Computer Vision: Feature Extraction

Objectives: To understand the problems of computer vision. To understand features in images and find those features using different computer vision algorithms.

Tools Used: Python

Procedure: Open IDLE and perform the following tasks.

Task 1

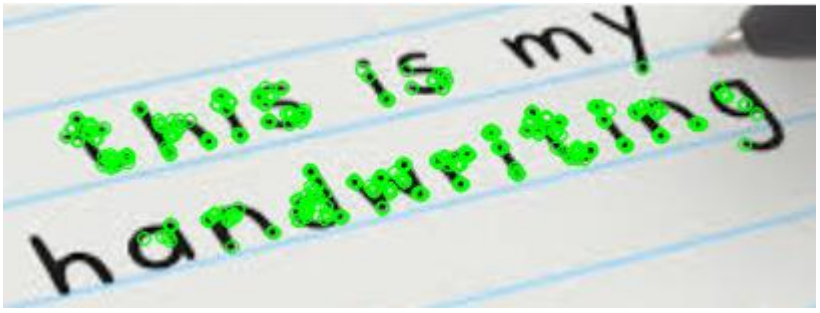
Take the image of your face. Make a copy and rotate that copy. Find features on your face using any algorithm e.g SIFT, SURF, ORB.

```python
import cv2
import numpy as np
img = cv2.imread("Screenshot 2024-12-19 092413.png")
rotated_img = cv2.rotate(img, cv2.ROTATE_90_CLOCKWISE)
gray_img = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
gray_rotated = cv2.cvtColor(rotated_img, cv2.COLOR_BGR2GRAY)
orb = cv2.ORB_create()
keypoints1, descriptors1 = orb.detectAndCompute(gray_img, None)
keypoints2, descriptors2 = orb.detectAndCompute(gray_rotated, None)
bf = cv2.BFMatcher(cv2.NORM_HAMMING, crossCheck=True)
matches = bf.match(descriptors1, descriptors2)
matches = sorted(matches, key=lambda x: x.distance)
matched_img = cv2.drawMatches(img, keypoints1, rotated_img, keypoints2, matches[:10], None, flags=cv2.DrawMatchesFlags_NOT_DRAW_SINGLE_POINTS)
cv2.imshow("Matched Features", matched_img)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

Task 2

Write your name and one life goal on a plain paper. Use that image to find handwriting on it using ORB, SIFT or FAST.

```python
handwriting_img = cv2.imread("Screenshot 2024-12-19 091725.png")
gray_handwriting = cv2.cvtColor(handwriting_img, cv2.COLOR_BGR2GRAY)
orb = cv2.ORB_create()
keypoints, descriptors = orb.detectAndCompute(gray_handwriting, None)
keypoints_img = cv2.drawKeypoints(handwriting_img, keypoints, None, color=(0, 255, 0))
cv2.imshow("Handwriting Keypoints", keypoints_img)
cv2.waitKey(0)
cv2.destroyAllWindows()
```



Submission Date: **Signature:**