BIOMETRICS

PROJECT WORK

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import cv2

import numpy as np

def mse(imageA, imageB):

    # Compute Mean Squared Error between two images

    err = np.sum((imageA.astype("float") - imageB.astype("float")) \*\* 2)

    err /= float(imageA.shape[0] \* imageA.shape[1])

    return err

def compare\_images(image1, image2):

    # Resize images to the same size if necessary

    if image1.shape != image2.shape:

        image2 = cv2.resize(image2, (image1.shape[1], image1.shape[0]))

    # Compute MSE between the two images

    error = mse(image1, image2)

    return error

def capture\_live\_image(camera\_index=0, output\_path='live\_image.jpg'):

    # Capture live image from webcam

    cap = cv2.VideoCapture(camera\_index)

    ret, frame = cap.read()

    if ret:

        # Convert frame to grayscale and then apply thermal-like effect

        gray\_frame = cv2.cvtColor(frame, cv2.COLOR\_BGR2GRAY)

        thermal\_frame = cv2.applyColorMap(gray\_frame, cv2.COLORMAP\_JET)

        cv2.imwrite(output\_path, thermal\_frame)

        cap.release()

        return thermal\_frame

    else:

        cap.release()

        raise Exception("Failed to capture live image.")

def authenticate\_user(stored\_image\_path='C:\\phone\\engineering\\sem 7\\biometrics\\project\\image2.jpg', live\_image\_path='live\_image.jpg'):

    # Load stored image

    stored\_image = cv2.imread(stored\_image\_path)

    # Capture live thermal image

    live\_image = capture\_live\_image(output\_path=live\_image\_path)

    # Compare the stored image and live image

    error = compare\_images(stored\_image, live\_image)

    # Set a threshold for authentication

    if error < 35000:  # Adjust based on your testing

        print("Authenticated successfully!")

    else:

        print("Authentication failed. Images do not match.")

# Example usage

authenticate\_user()